



AMATS 2040 MTP Update

System Deficiency Travel Modeling Analysis

May 25, 2017

Topics

- Model Overview
- Land-Use Inputs
- Future-year “Existing + Committed” Networks
- System Deficiency Analysis
- Discussion





Travel Model Overview

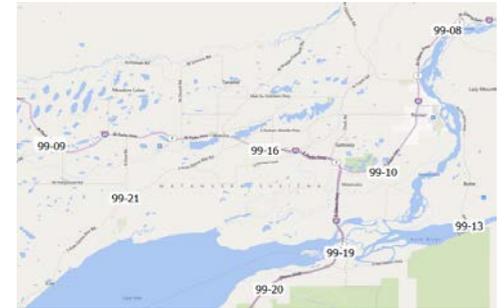
Travel Model Overview

- Delivered 2015
- Covers entire region including MOA and MSB
 - Spatial and network enhancements
 - Increased sensitivities
 - User-friendly implementation
- Calibrated and validated to 2013 base-year
- Includes land-use forecasts for 2028 and 2040
- Sensitivity testing performed to ensure reasonable model responses



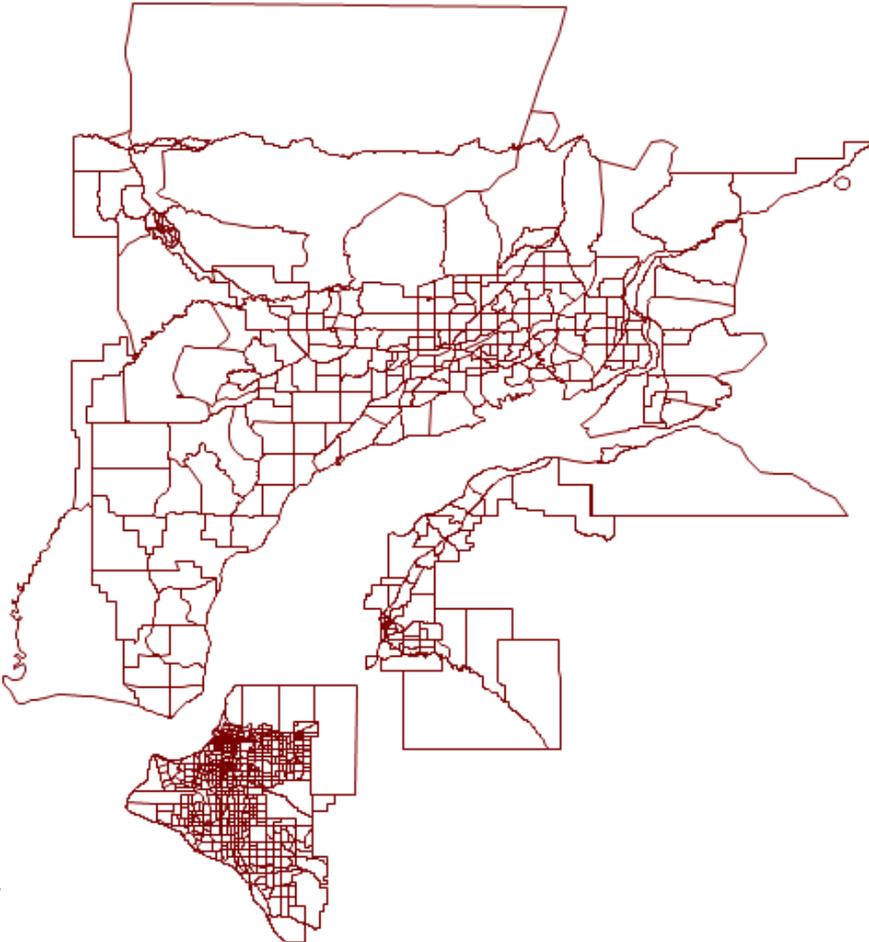
Data For Model Development

- Regional household travel survey
- On-board transit survey
- Bluetooth OD Survey
- American Transportation Research Institute data
- American Community Survey (ACS) data
- Land-use data
- Traffic counts
- Other Assorted Data

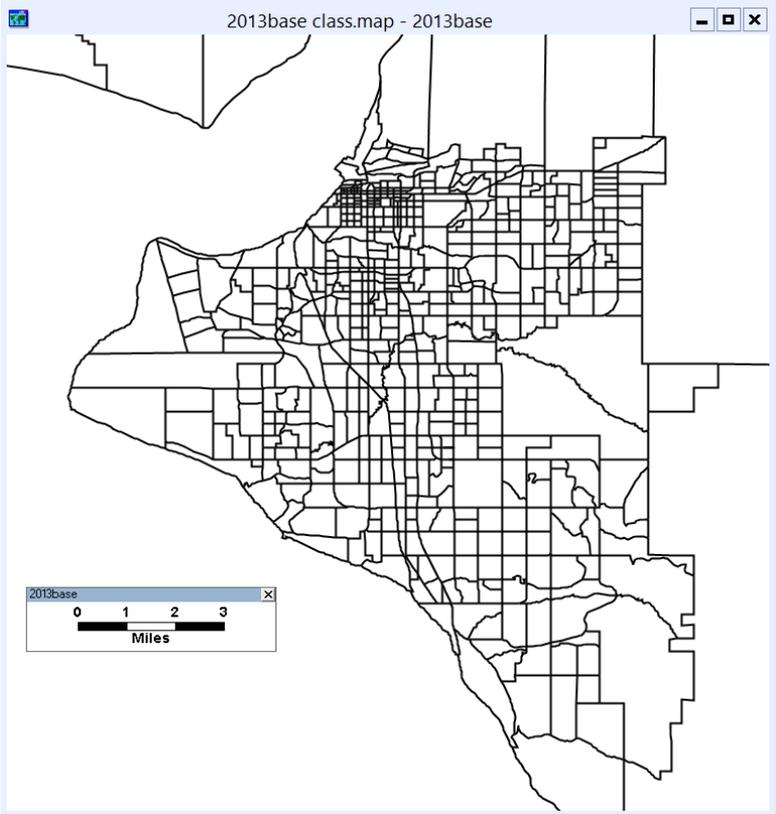


Spatial System

Region (914 internal TAZS)



Anchorage Bowl



Market segmentation

- *Seven* Trip Purposes
 - Home-based work, school, *university*, shop, other + non-home-based work and other
- *Four* income categories
 - Low (< \$25k)
 - Medium-low (\$25k - \$50k)
 - Medium-high (\$50k - \$100k)
 - High (\$100k+)
- *Three* auto sufficiency categories
 - 0 Autos
 - Auto insufficient (autos>0 & autos<adults)
 - Auto sufficient (autos>=adults)
- *Three* time periods
 - AM peak (7 AM to 9 AM - 2 hours)
 - PM peak (3 PM to 6 PM – 3 hours)
 - Off-peak (rest of day)



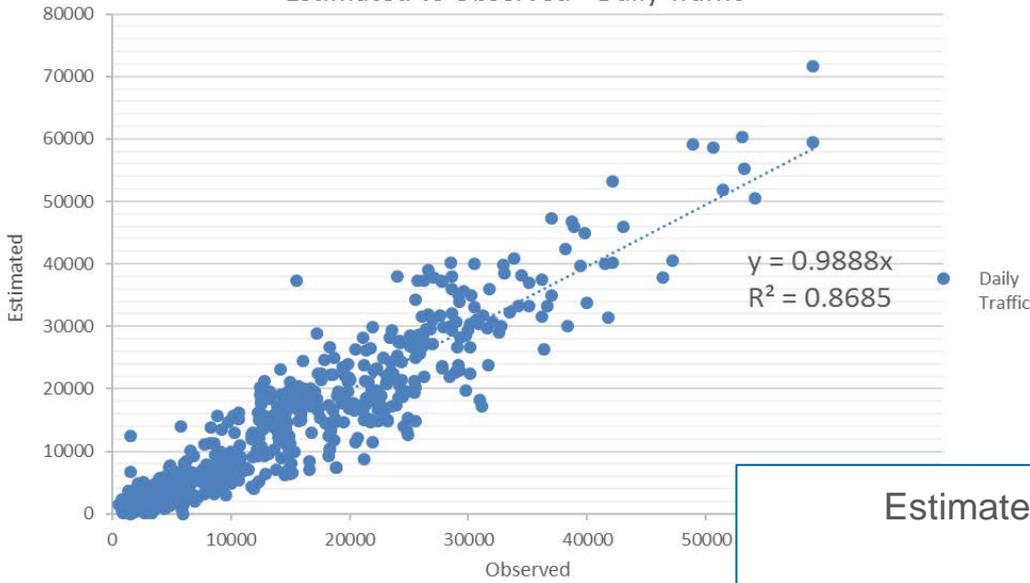
Other Travel Markets

- Commercial Vehicles based on ATRI data
- Visitor trips generated based on hotel room inventory\occupancy + household visitors (small)
- Airport trips based on enplanements – transfers and distributed to hotels + households
- External trip tables based on Bluetooth data analysis

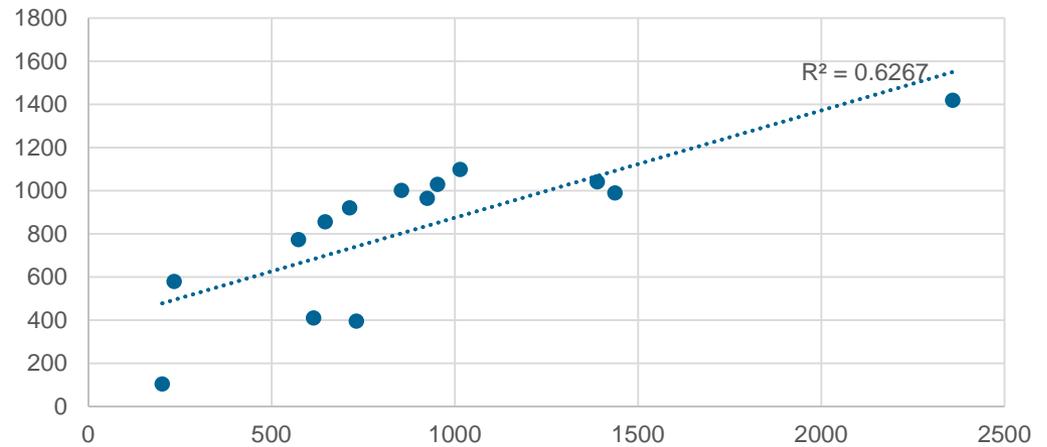


Model Validation

Estimated vs Observed - Daily Traffic



Estimated versus Observed Bus Boardings By Route



Model Outputs

Travel Time and Cost By Income Group

Total and Average Travel Time and Cost By Income Group

Income Group	Total Time	Total Out-Pocket Cost	Total Trips	Average Time	Average Out-Pocket Cost
LOW	2158095	\$229670	284333	7.59	\$0.81
MLO	2994093	\$354842	364764	8.21	\$0.97
MHI	5535652	\$686377	608460	9.1	\$1.13
HI	6736955	\$866520	694611	9.7	\$1.25
TOTAL	17424796	\$2137410	1952169	8.93	\$1.09

HBW Total and Average Travel Time and Cost By Income Group

Income Group	Total Time	Total Out-Pocket Cost	Total Trips	Average Time	Average Out-Pocket Cost
LOW	170462	\$19385	12699	13.42	\$1.53
MLO	400850	\$55097	30932	12.96	\$1.78
MHI	979282	\$144679	68215	14.36	\$2.12
HI	1409023	\$212803	98383	14.32	\$2.16
TOTAL	2959617	\$431965	210229	14.08	\$2.05

HBC Total and Average Travel Time and Cost By Income Group

Income Group	Total Time	Total Out-Pocket Cost	Total Trips	Average Time	Average Out-Pocket Cost
LOW	108297	\$4489	10932	9.91	\$0.41
MLO	110066	\$6379	11717	9.39	\$0.54

VMT, VHT, VHD, Centerline Miles, Total Capacity, Total Flow, Max Flow and Min Flow By Facility

Facility	Vehicle Miles of Travel	Vehicle Hours of Travel	Vehicle Hours of Delay	Centerline Miles	Total Capacity	Total Flow	Max Flow	Min Flow
Tudor	195058	5954	1377	17	3432000	1376290	31735	2306
Dimond_Abbott	153233	4016	288	29	3978000	960418	27927	1
Muldoon	112102	3050	353	11	2223000	779170	21035	2252
Seward SB	151923	2744	55	22	963300	324404	21251	350
Seward NB	161677	3138	238	22	988000	375615	23856	383
OMalley	43583	1081	70	13	962000	196384	17092	447
MinnesotaDr SB	86062	1459	2	15	815100	234564	19200	752
MinnesotaDr NB	65956	1234	26	15	592800	140025	12587	1212
Total	969595	22678	2409	144	13954200	4386870	31735	1



Future Land-Use

Future Land Use

- Policy Committee Resolution states that we use the socio-economic assumptions developed by RSG\McDowell Group as part of model development project
 - ADOLWD household and employment forecasts for 2028 and 2040
- Limited changes in land-use developed for model development project
 - Household growth in key locations in MOA updated to be consistent with the most recent Land Use Plan Map changes through coordination with MOA Planning Department
 - Revised MSB TAZ allocations through coordination with MSB based on the MSB's published transportation plan allocation without KAC
 - 2030 developed for AMATS MTP by interpolation



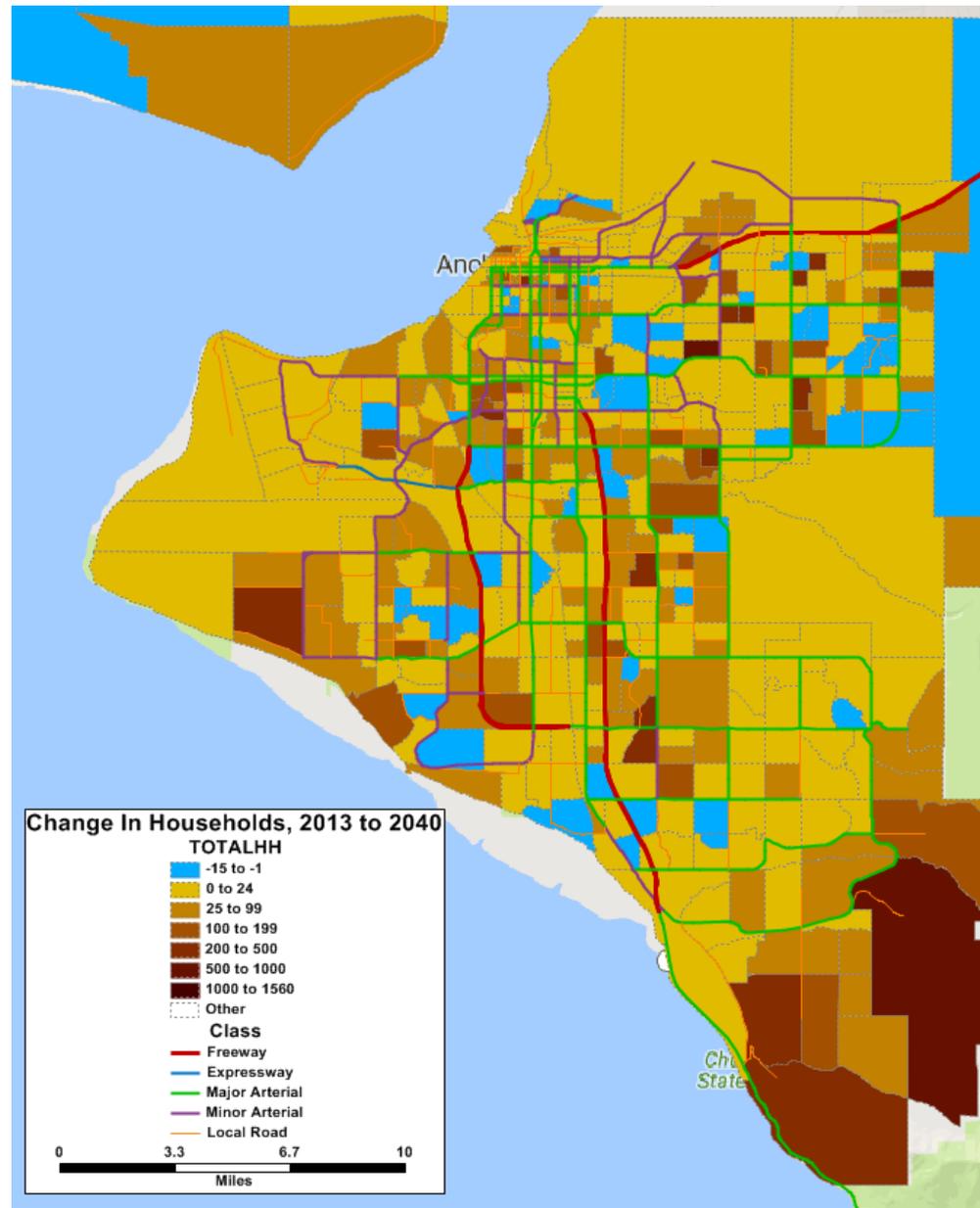
Without KAC 2030 and 2040 Forecasts

- Same total households and employment (by type) for MSB as developed for model update project
- Allocated to TAZs using proportion of growth by TAZ in MSB LRTP “Without KAC” forecasts
 - Percent change in MSB TAZ = Change in households in MSB TAZ/Change in total households in MSB
 - Revised 2040 households in MSB TAZ = 2013 households in MSB TAZ + change in total households in MSB * percent change in MSB TAZ
- Shifts growth out of Point MacKenzie area into rest of MSB\Palmer

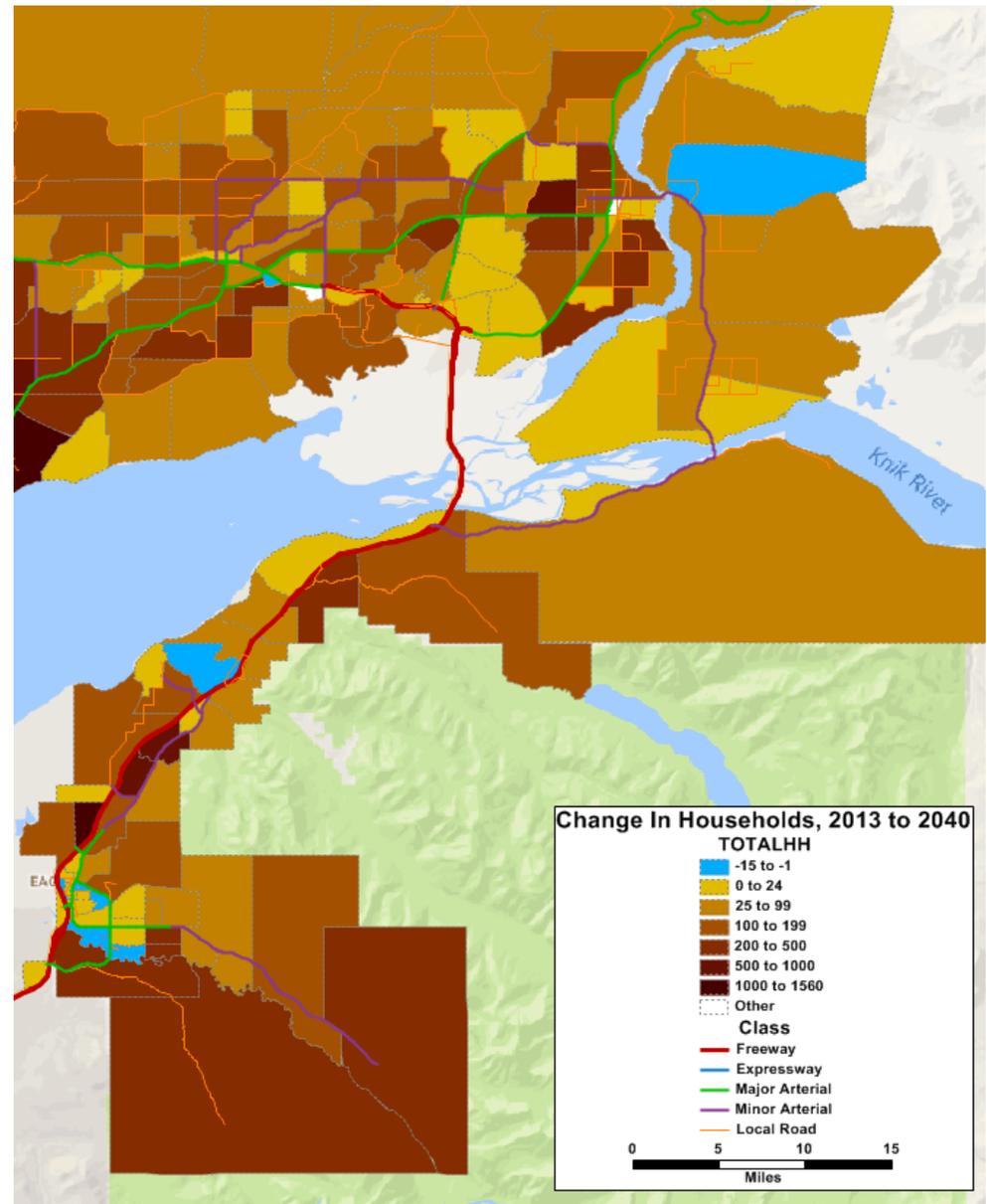


Change in Households, 2013 to 2040: MOA

Note: No difference in “With KAC” and “Without KAC” land-use forecasts for MOA as per planning department

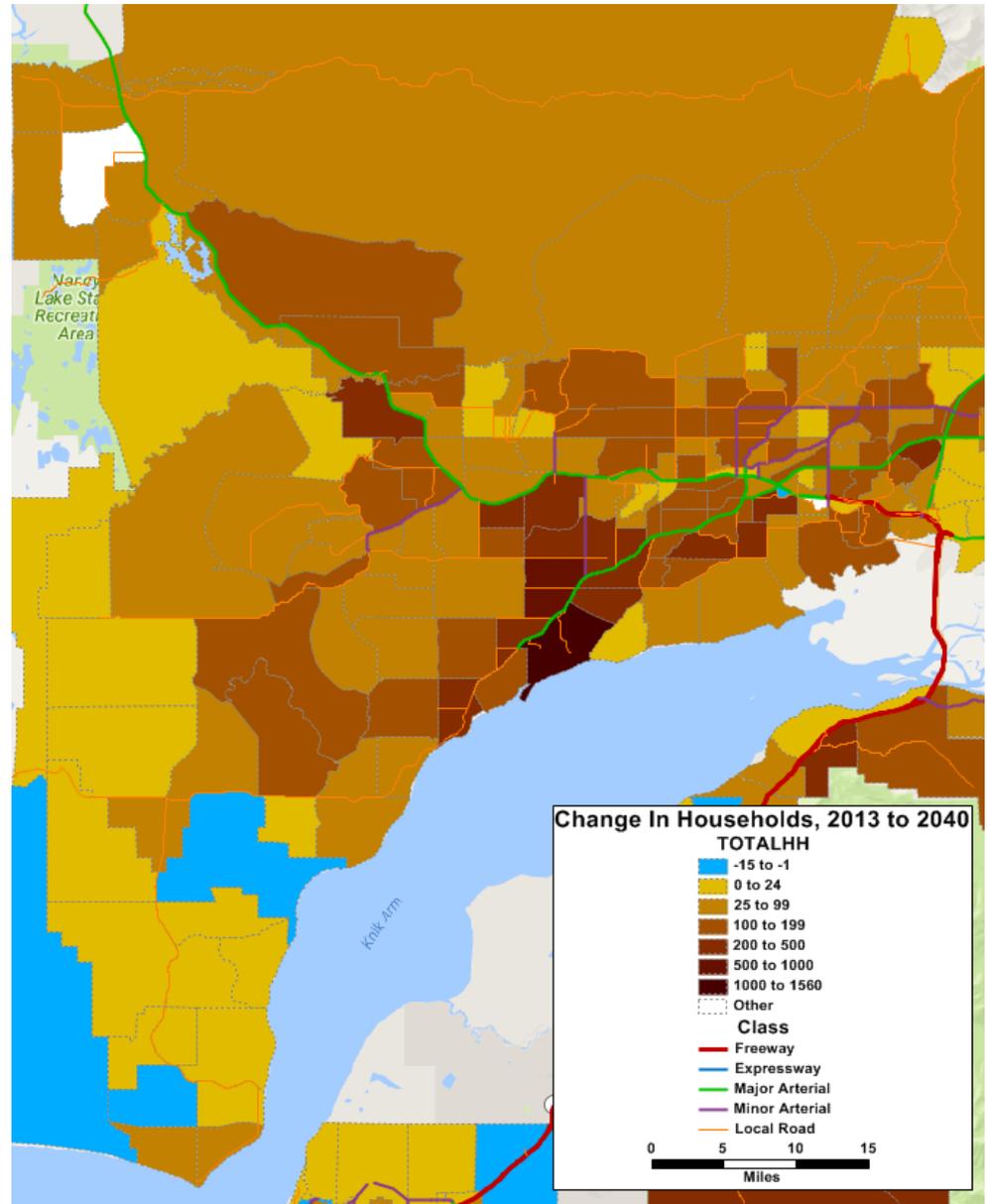


Change in Households, 2013 to 2040: CER

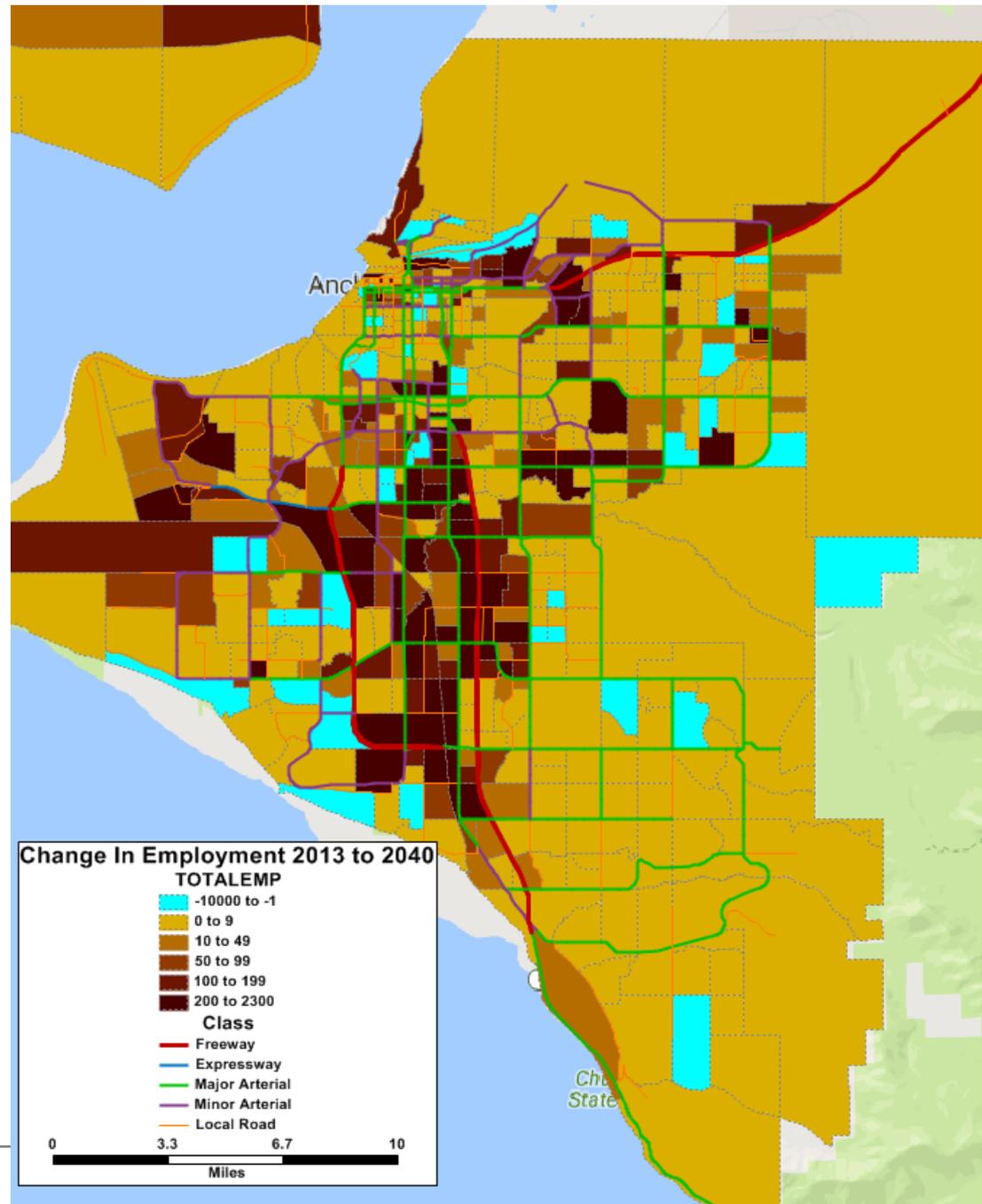


Change in Households, 2013 to 2040: MSB

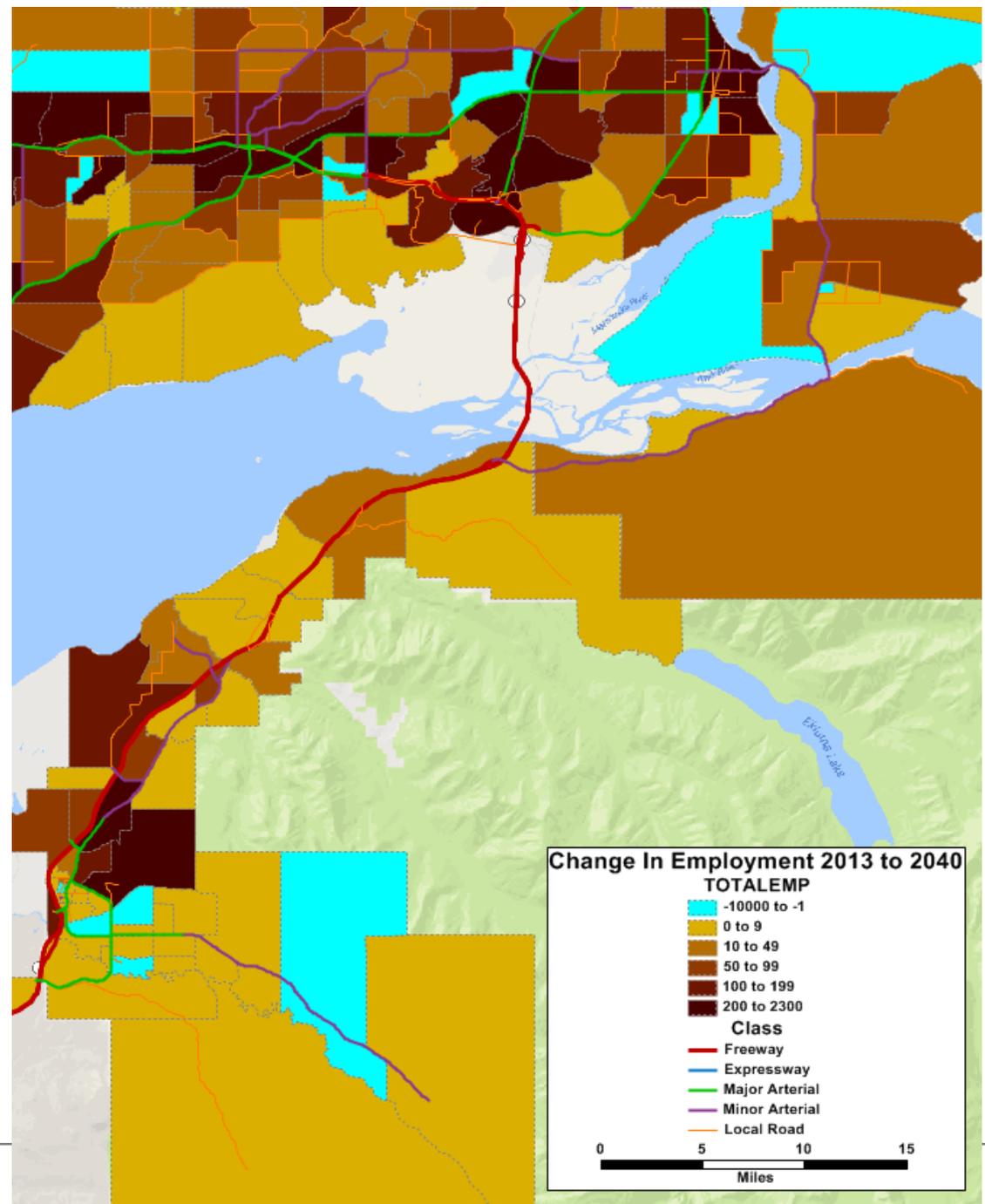
Note: Reviewed with MSB staff May 10, 2017



Change in Employment, 2013 to 2040: MOA

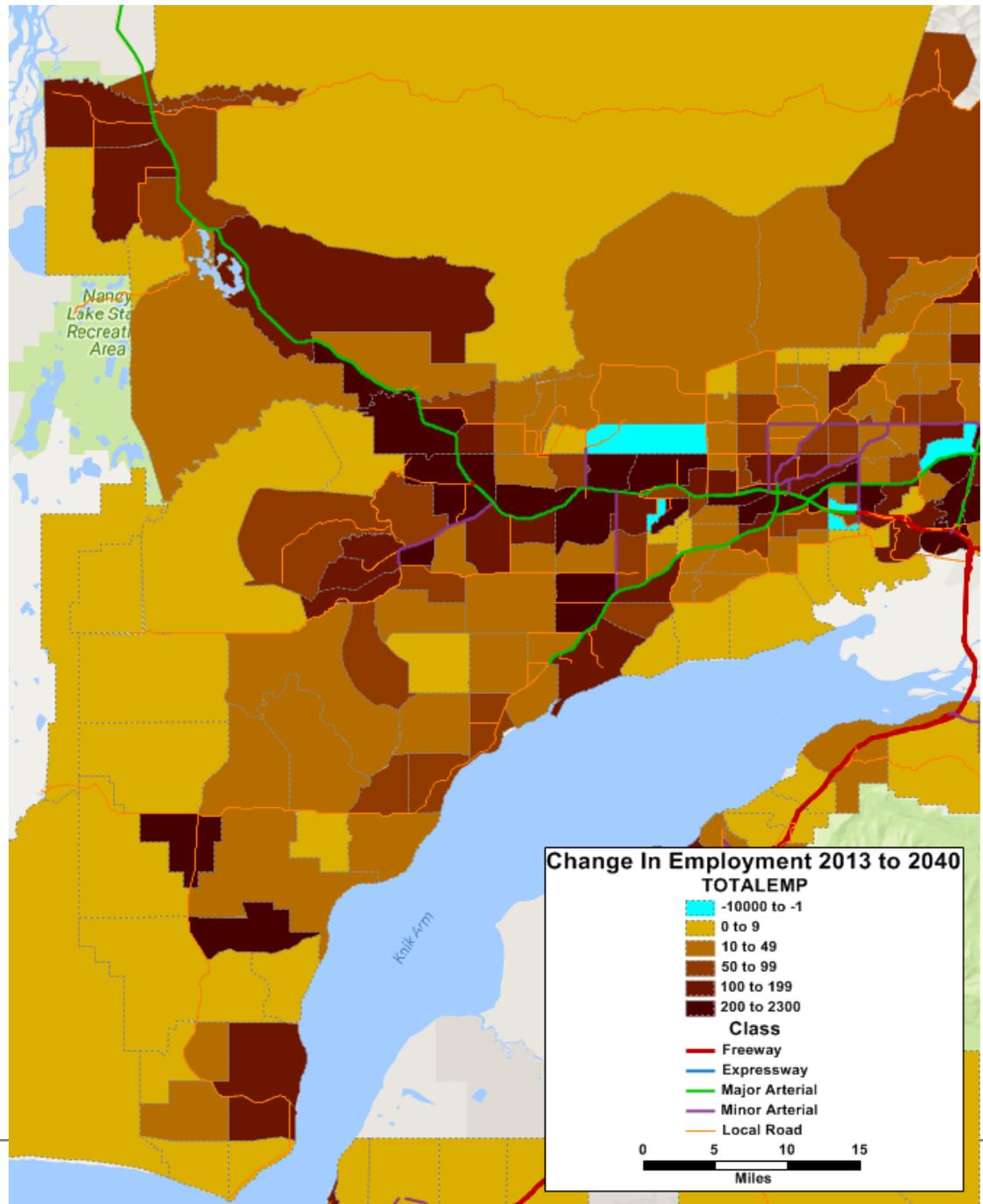


Change in Employment, 2013 to 2040: CER



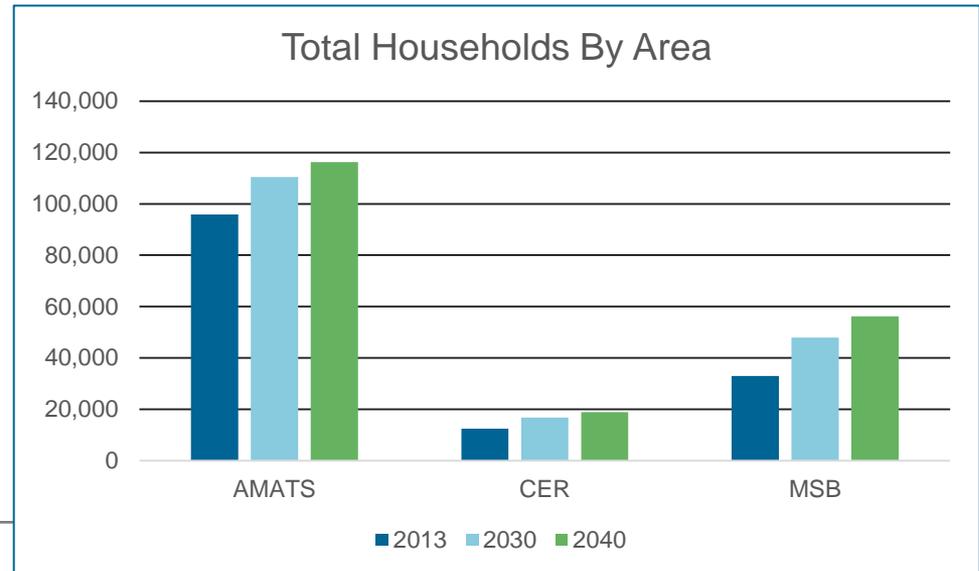
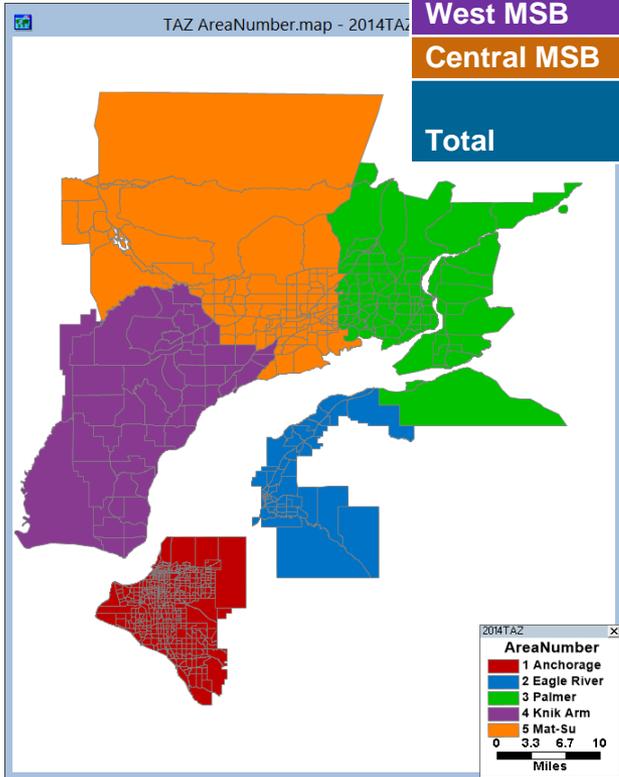
Change in Employment, 2013 to 2040: MSB

Note: Reviewed with MSB staff May 10, 2017



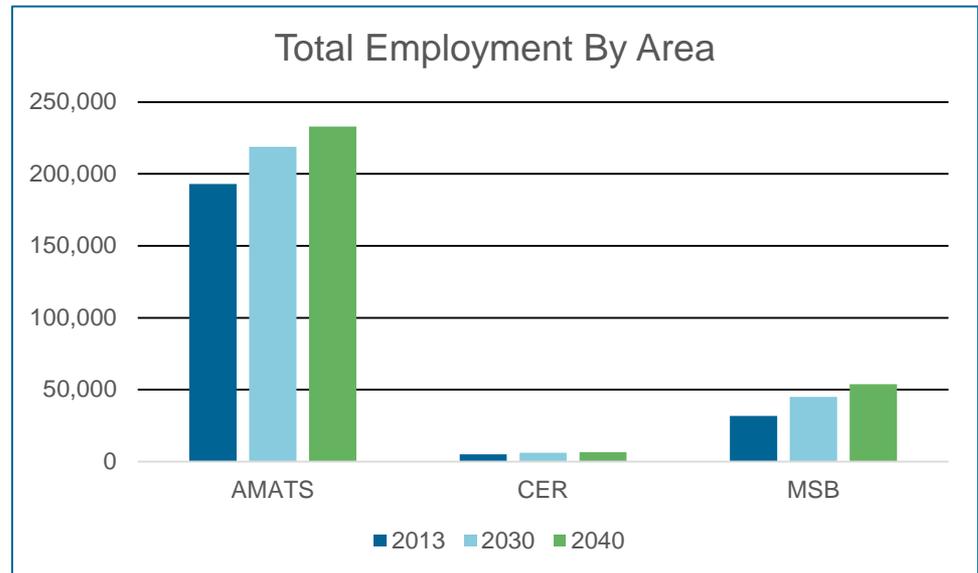
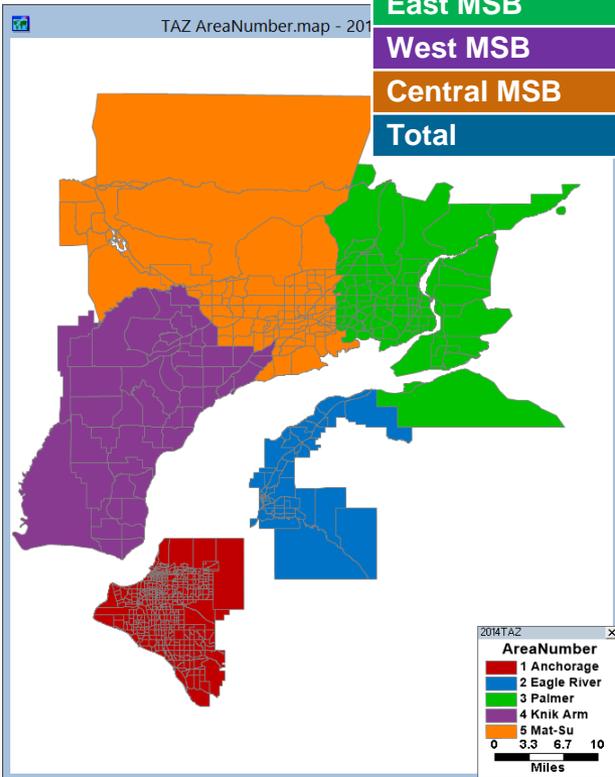
Total Households By Area

District Name	2013	With KAC		Without KAC	
		2030	2040	2030	2040
Anchorage Bowl	95,867	110,451	116,246	110,451	116,246
Chugiak\Eagle River	12,474	16,804	18,837	16,804	18,837
East MSB	13,525	18,052	20,597	18,574	21,364
West MSB	5,330	10,080	12,714	9,045	11,098
Central MSB	14,095	19,764	22,949	20,263	23,675
Total	141,291	175,151	191,343	175,137	191,220



Total Employment By Area

District Name	2013	With KAC		Without KAC	
		2030	2040	2030	2040
Anchorage Bowl	192,958	218,753	232,866	218,753	232,866
Chugiak\Eagle River	5,100	6,256	6,598	6,256	6,598
East MSB	14,005	18,737	22,059	19,035	22,474
West MSB	1,516	6,720	10,116	3,961	5,619
Central MSB	16,200	19,437	21,650	21,707	25,185
Total	229,779	269,903	293,289	269,712	292,742





Existing Plus Committed Network

Existing Plus Committed Projects

- Base year of model is 2013
- Existing + Committed Projects
 - All projects constructed since 2013 and projects in pipeline with committed funding
 - Coded in both 2030 and 2040 networks
 - Model considers capacity increases, extensions, changes in speed, presence of medians, and several other network characteristics
 - Includes proposed transit system changes to be implemented later this year



MOA E+C Projects

Project Name	From	To	Description
Dowling Road Extension	Minnesota Drive	Old Seward Highway	2 lanes in each direction
Glenn Highway - Northbound Lanes	Hiland Rd	Artillery Rd	Adding 1 lane to the northbound direction
92nd Avenue	Seward Hwy	Old Seward Highway	1 lane in each direction Auxiliary lane from Diamond Blvd to 92nd Ave Auxiliary lane from 92nd Ave to O'Malley Rd
Arctic Boulevard Reconstruction	36th Ave	Tudor Ave	1 lane each direction plus center turn lane
36th Ave - Artice Boulevard to C Street 5 Lane Conversion	Artice Boulevard	C Street	2 lanes in each direction
O'Malley Road Reconstruction	Seward Highway	Lake Otis Parkway	2 lanes in each direction
Seward Highway	Dimond Blvd	Dowling Road	3 lanes in each direction
100th Avenue Extension	Minnesota	C Street	1 lane in each direction w/center turn lane
Muldoon Road\Glenn Highway			2 lanes in each direction
Jewel Lake Road	88th Ave	Strawberry	1 lane in each direction w/center turn lane
Abbott Road Rehabilitation Phase I	Lake Otis Parkway	Jupiter Drive	1 lane in each direction
Abbott Road Rehabilitation Phase II	Jupiter Drive	Birch Road	1 lane in each direction w/center turn lane
Glenn Highway	Hiland Rd	Artillery Rd	Adding 1 lane to the Southbound direction
Klatt Road/Johns Road Roundabout			Roundabout

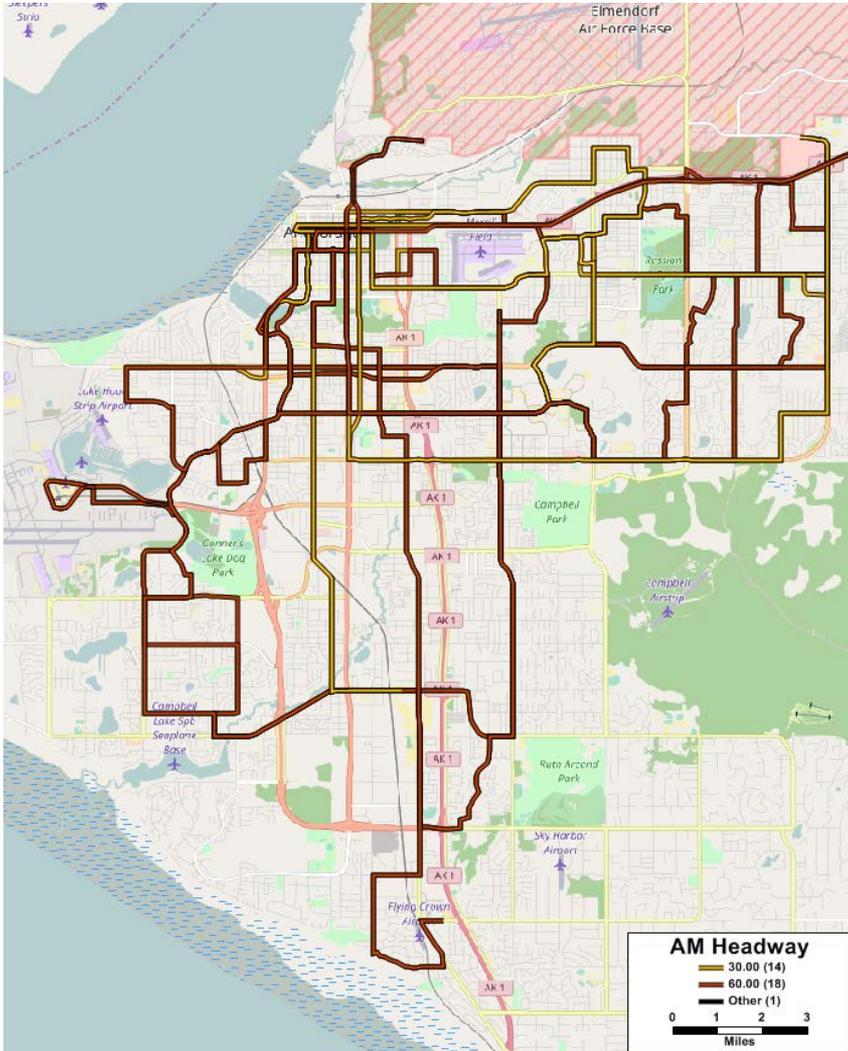


MSB E+C Projects

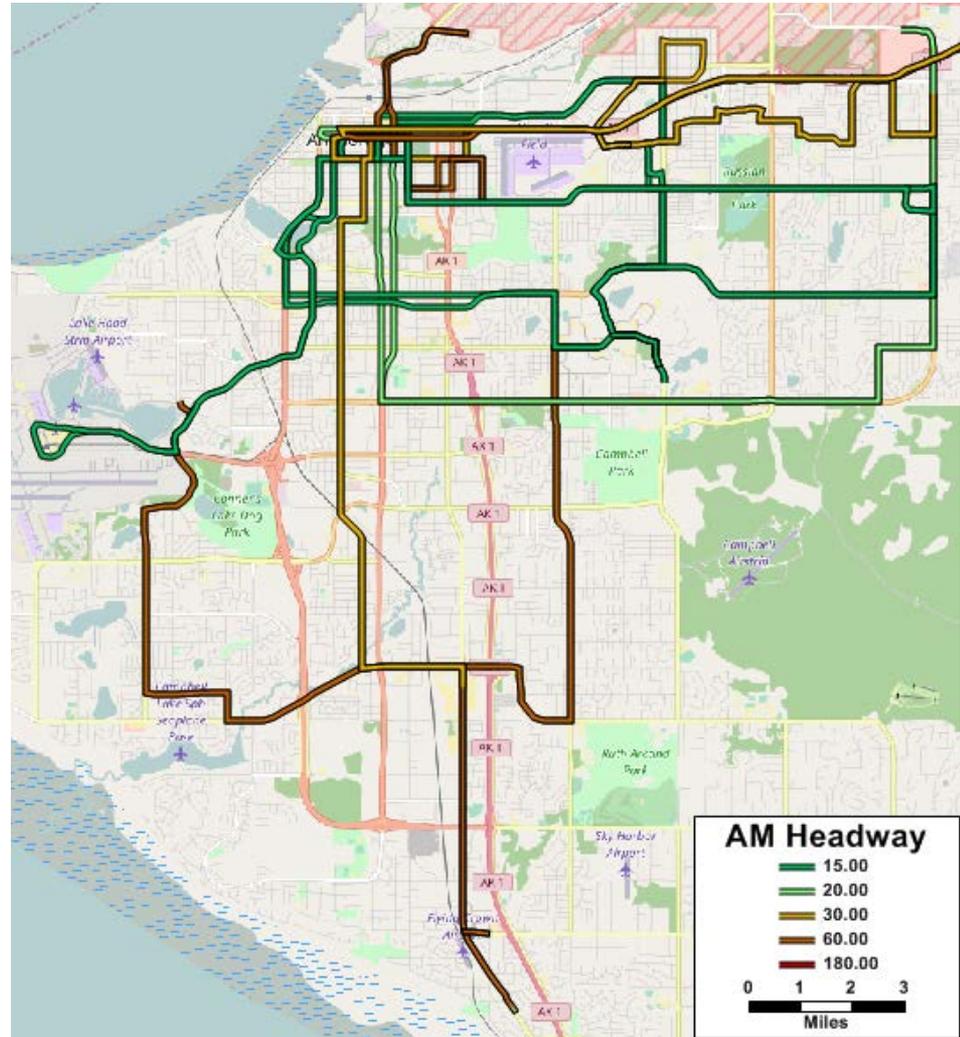
Project Name	From	To	Description
Bogard Road East Extension	N49 Ave	Arabian Street	1 lane in each direction
Fern Street Connection to Edlund	Fern	Edlund Rd	1 lane in each direction
Seldon Road/Lucille Street roundabout			Roundabout
Seldon Road	Church Rd	Beverly Lake Rd	1 lane in each direction
Trunk Road Improvements	George Parks Hwy	Bogard Rd	2 lanes in each direction
Trunk Road Extension South (part of above)	George Parks Hwy	Nelson Rd	1 lane in each direction
Glenn Highway MP 34-42 Reconstruction	George Parks Hwy	Arctic Street	2 lanes in each direction
Knik-Goose Bay Road	Centaur Rd	Vine Rd	2 lanes in each direction
Knik-Goose Bay Road Widening	Vine Rd	Settlers Bay	2 lanes in each direction
Parks Highway MP 43.5-48.3 - Church Road to Pittman Road	Church Rd	Pittman Rd	2 lanes in each direction
Seward Meridian Parkway	Palmer-Wasilla Highway	Bogard Rd	2 lanes in each direction
Seward Meridian Parkway	Bogard Rd	Seldon Rd	1 lane in each direction
Hermon Road Reconstruction and Extension	George Parks Hwy	Palmer-Wasilla Highway	2 lanes in each direction
Nelson Road Extension: extend to Fairview loop	Nelson Rd	Fairview Loop	1 lane in each direction
Engstrom Road Congestion Relief (to the east, route unknown)	Engstrom	Palmer-Fishhook Rd	1 lane in each direction
Engstrom North Extension	Engstrom	Tex Al	1 lane in each direction
 Tex Al Road Upgrade and Extension	Wasilla-Fishhook Rd	Palmer-Fishhook Rd	1 lane in each direction

Transit System Changes

2013



2030 & 2040





System Deficiency Analysis

System Deficiency Travel Modeling Analysis

- Goals
 - Understand travel patterns and compare transport performance of the “Existing + Committed” system in 2030 and 2040 to today
 - Provide a ‘baseline’ for comparison of future-year alternative scenarios
- 2030 and 2040 model runs include the “Existing + Committed” project list and the “Without KAC” land-use forecasts



Level-of-Service

Level-of-Service	Volume\Capacity Ratio	Description
A	< 0.6	Free-flow
B	0.6-0.7	Near free-flow
C	0.7-0.8	Stable
D	0.8-0.9	Approaching Unstable Flow
E	0.9-1.0	Unstable Flow
F	1.0 +	Forced or Breakdown Capacity

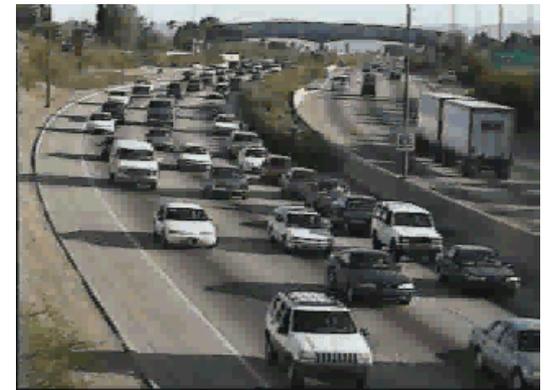
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Los E



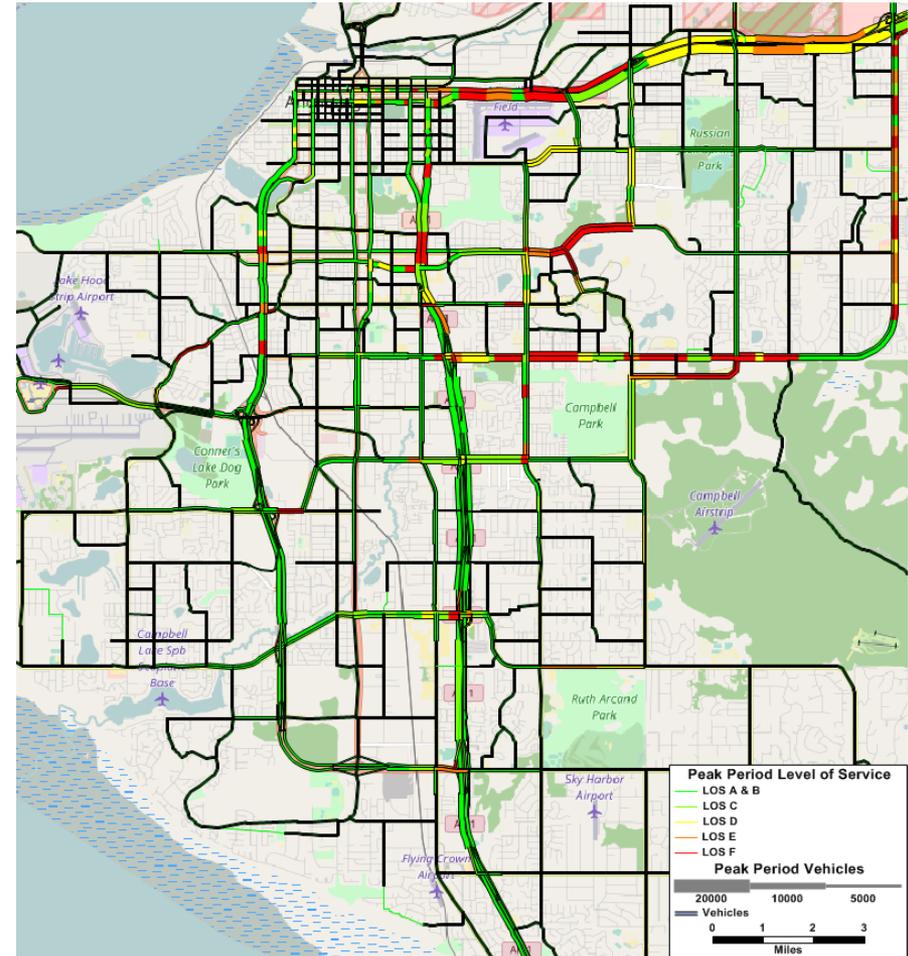
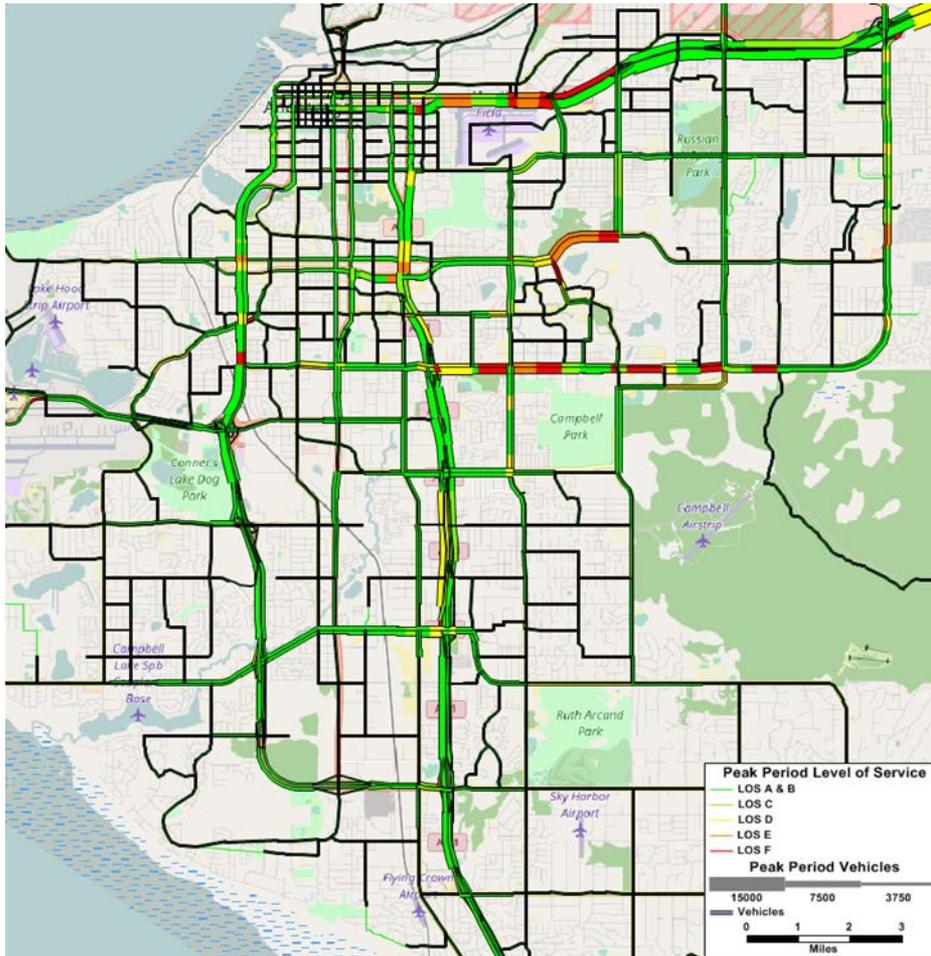
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Peak Period Volume-to-Capacity Ratio & Vehicle Flow

2013

2040

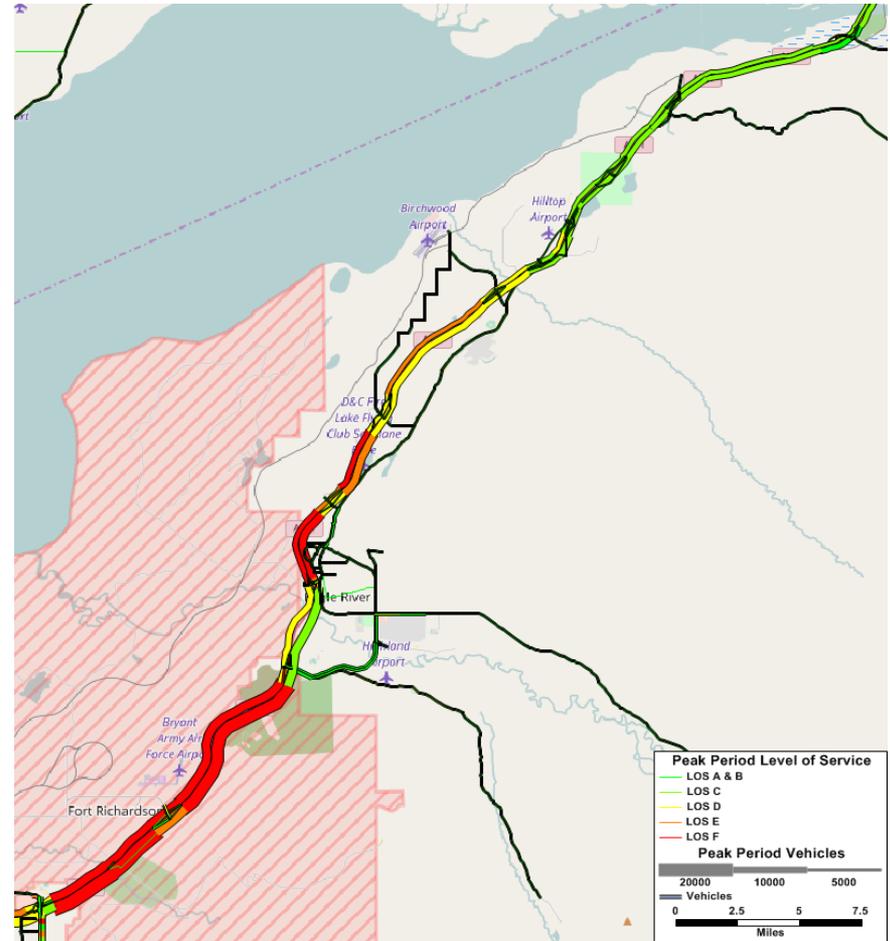
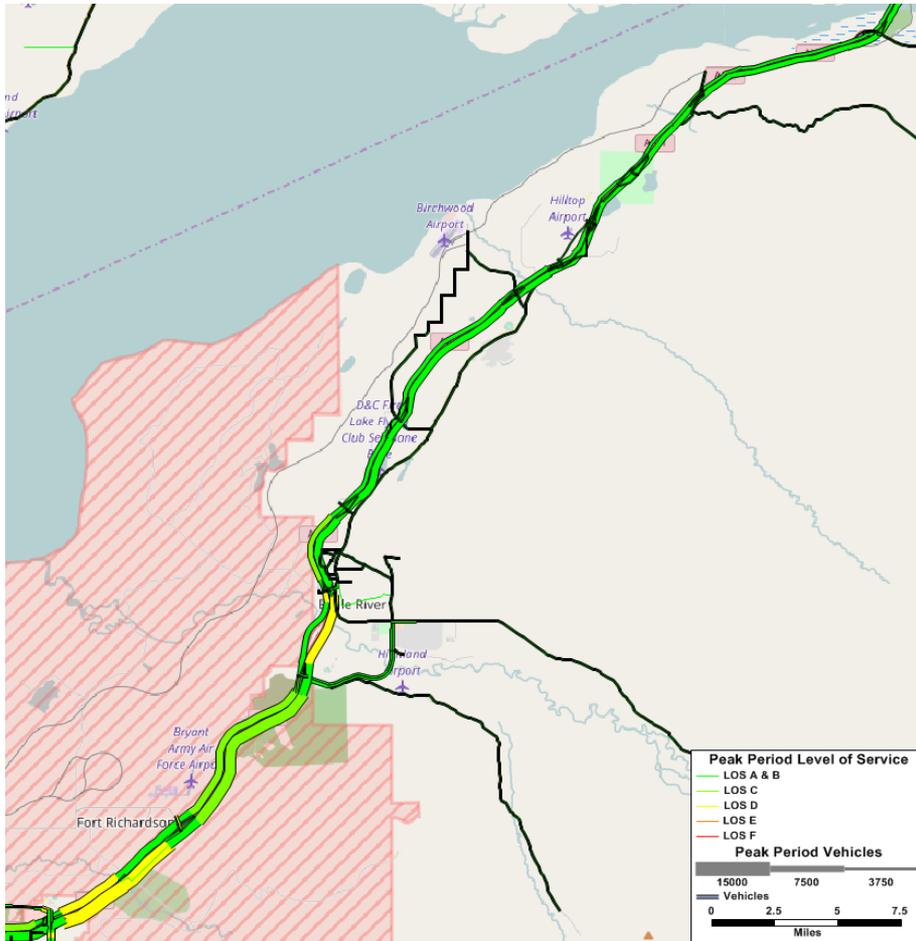


Note: These maps plot the worse of either AM Peak Period (7-9 AM) or PM Peak Period (3-6 PM) LOS; they were labelled "Total Daily Performance" in previous MTPs

Peak Period Volume-to-Capacity Ratio & Vehicle Flow

2013

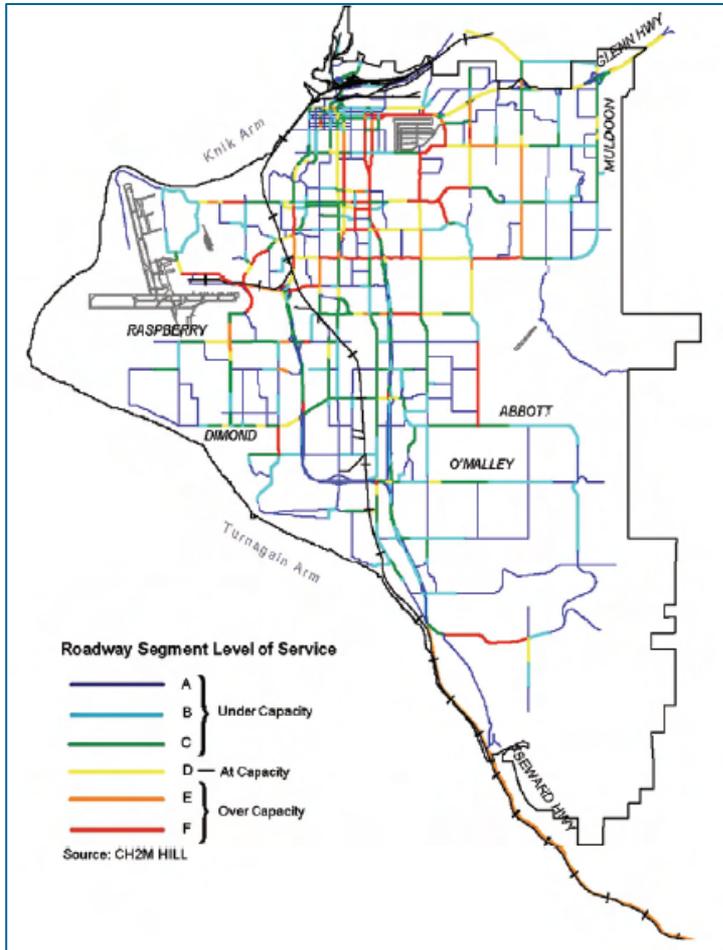
2040



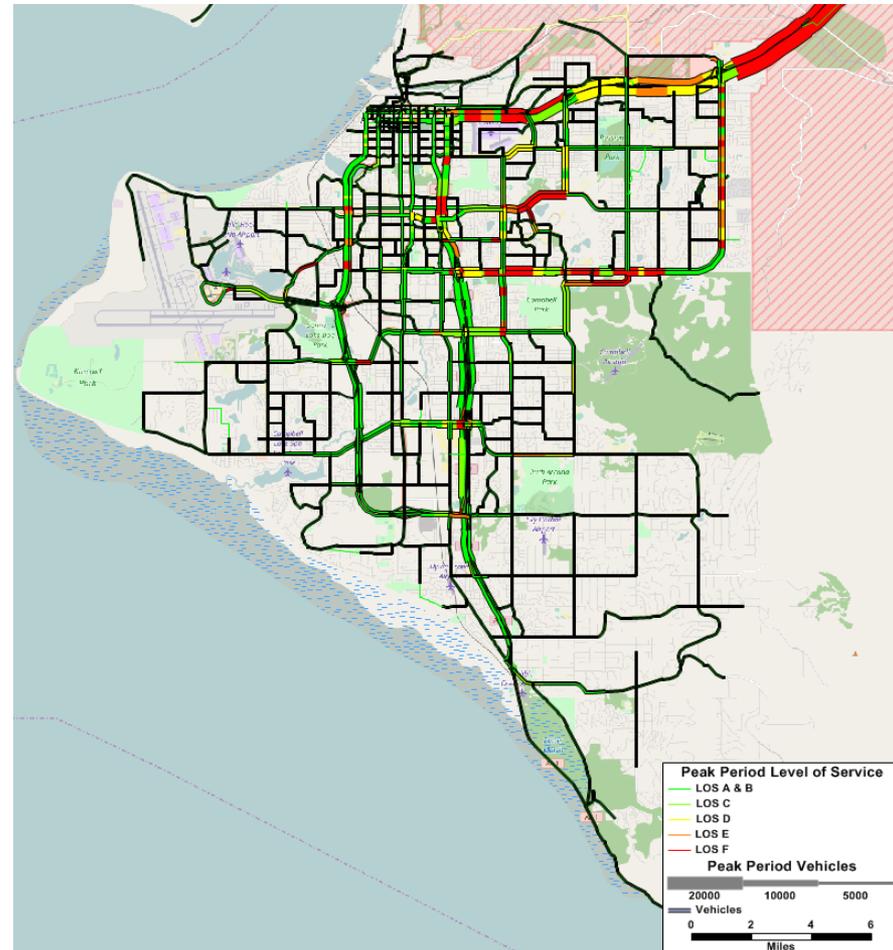
Note: These maps plot the worse of either AM Peak Period (7-9 AM) or PM Peak Period (3-6 PM) LOS

System Deficiency Comparison: 2025 MTP vs. 2040 MTP

2025



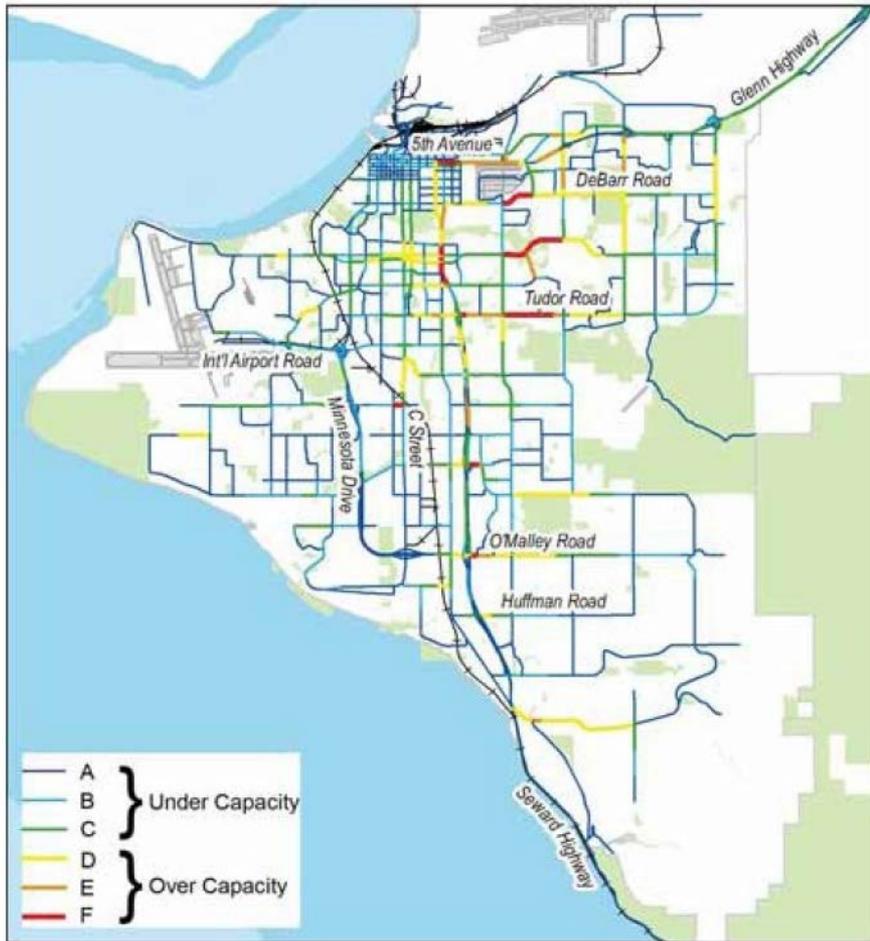
2040



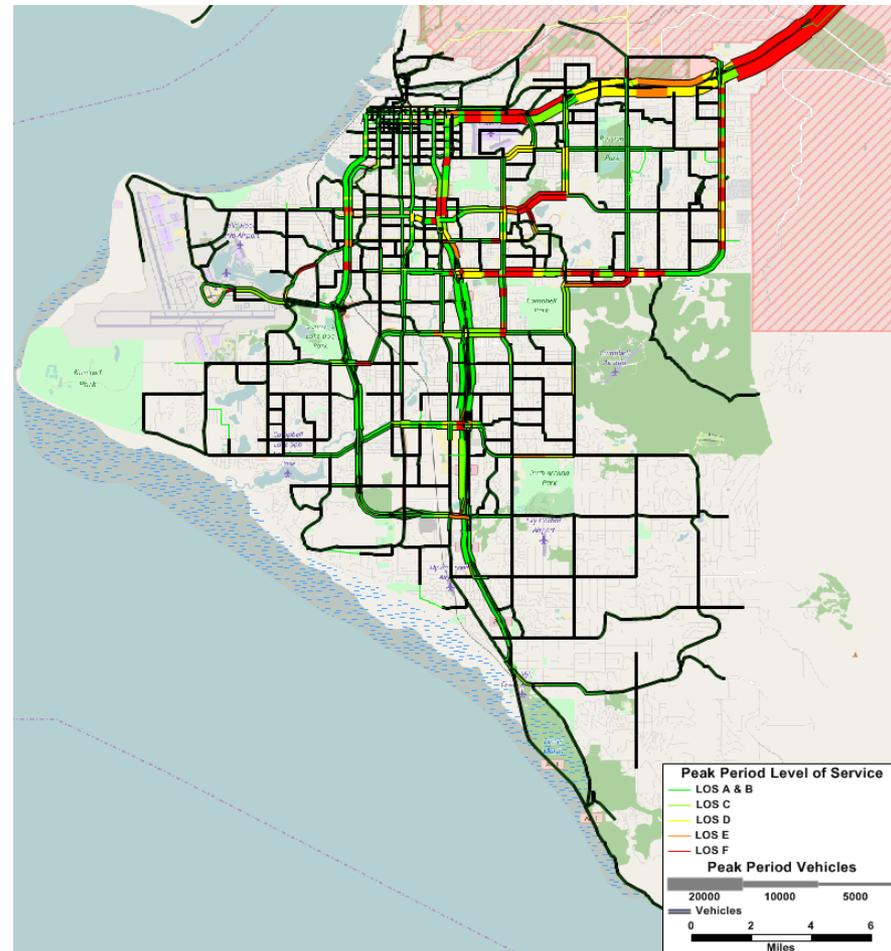
Note: The 2025 MTP E+C Network uses a 2002 base-year

System Deficiency Comparison: 2035 MTP vs. 2040 MTP

2035



2040



Note: The 2035 MTP E+C Network uses a 2010 base-year

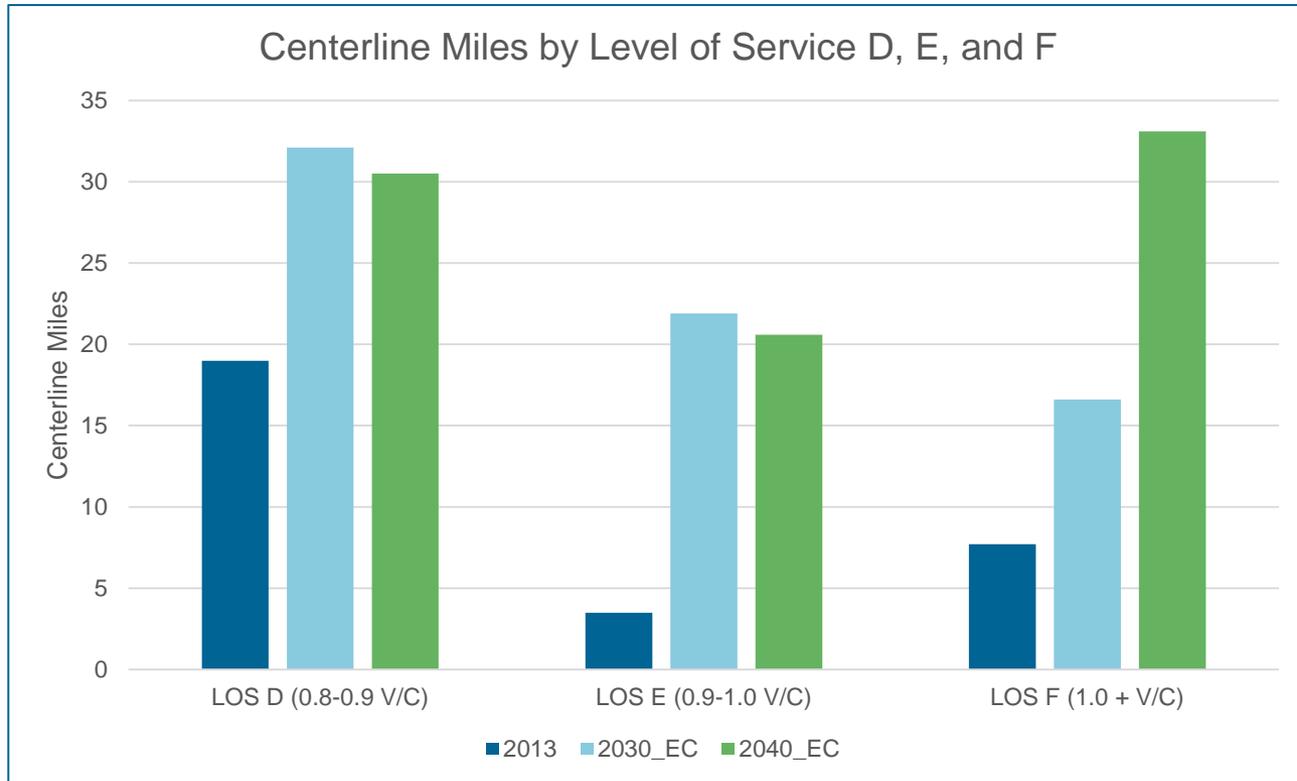
Vehicle Hours of Delay for Key Facilities

Facility	Scenario			Percent Increase	
	2013	2030_EC	2040_EC	2013 to 2030	2013 to 2040
Tudor Road	217	268	332	23.5%	53.0%
Dimond\Abbott Road	50	61	73	22.0%	46.0%
Muldoon Road	41	69	91	68.3%	122.0%
Seward Highway Southbound	49	30	41	-38.8%	-16.3%
Seward Highway Northbound	70	57	75	-18.6%	7.1%
O'Malley Road	10	16	21	60.0%	110.0%
Minnesota Drive Southbound	2	2	3	0.0%	50.0%
Minnesota Drive Northbound	4	5	6	25.0%	50.0%

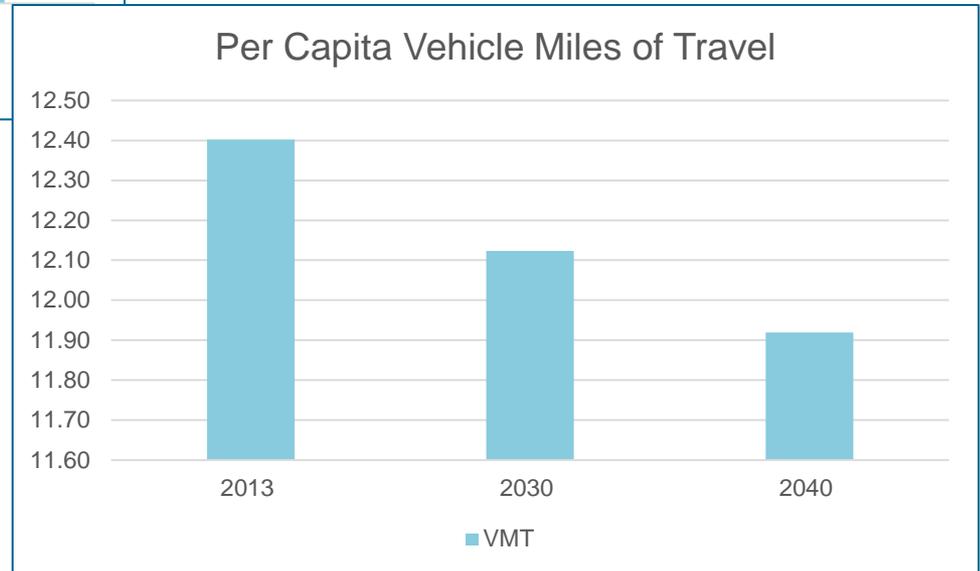
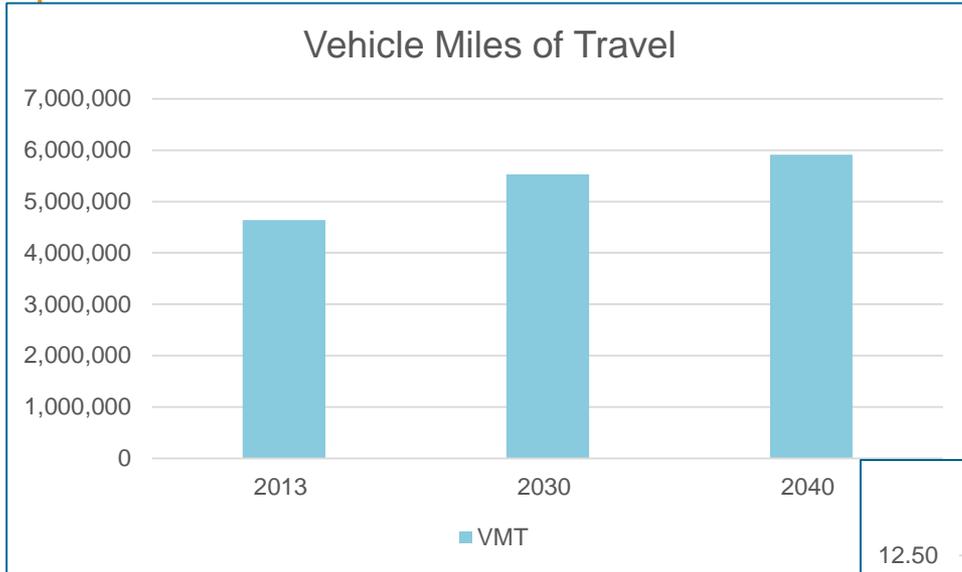


Level-of-Service Summary

(Total AM Peak, PM Peak and Off-Peak Periods)



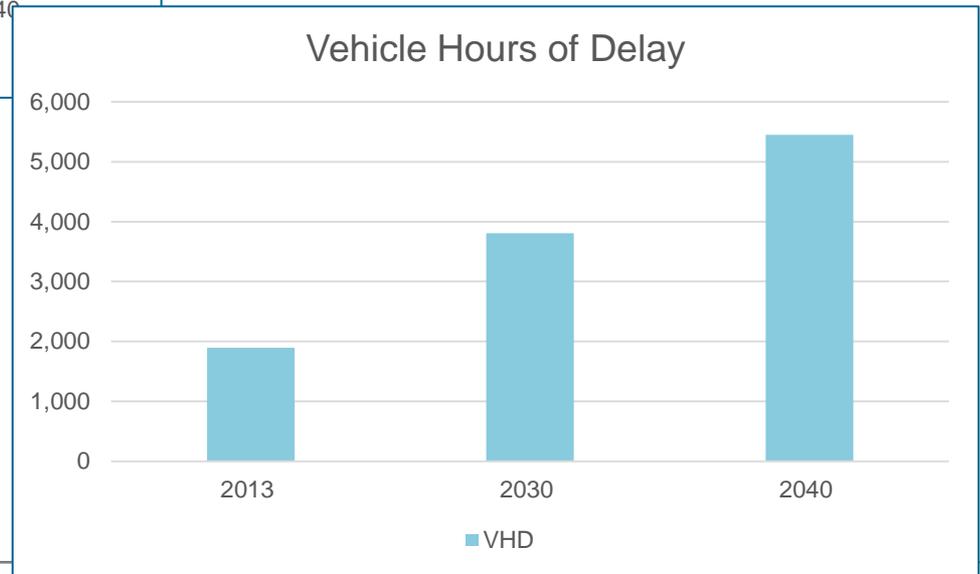
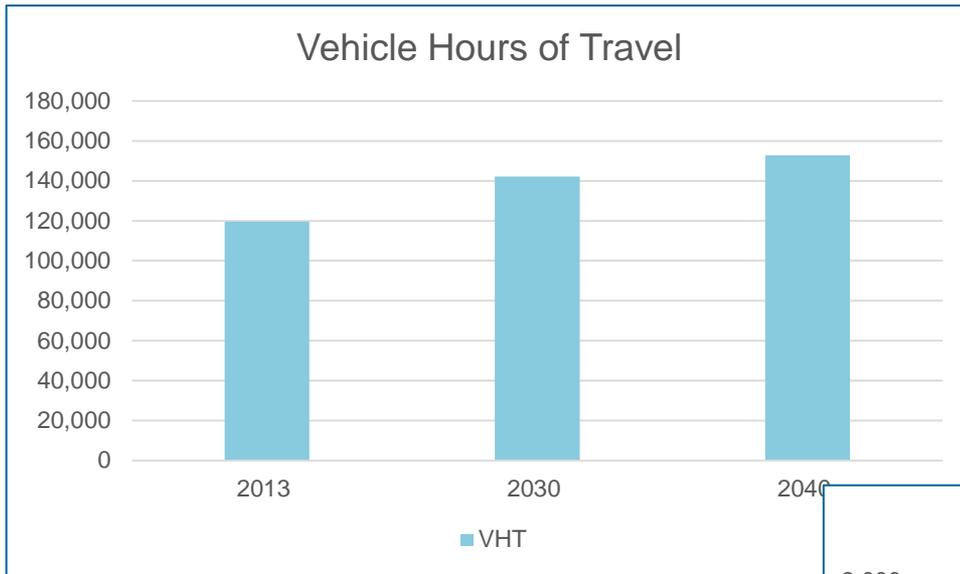
Total Daily Vehicle Miles of Travel



Note: VMT shown for AMATS portion of model network. Per capita VMT calculated based on AMATS population



Total Daily Vehicle Hours of Travel, Delay



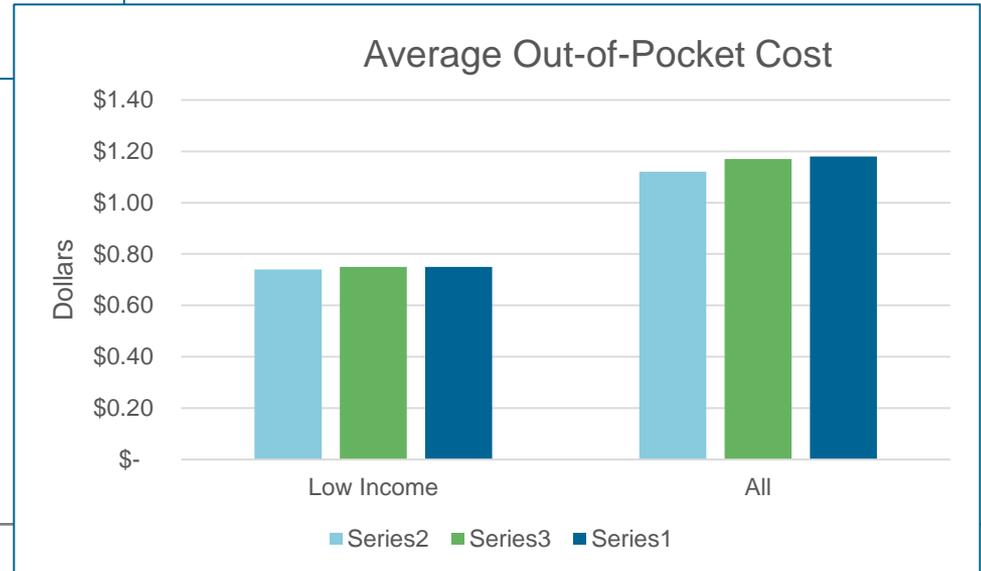
Note: VHT and VHD shown for AMATS portion of model network.



Average Travel Time and Out-of-Pocket Cost Per Trip

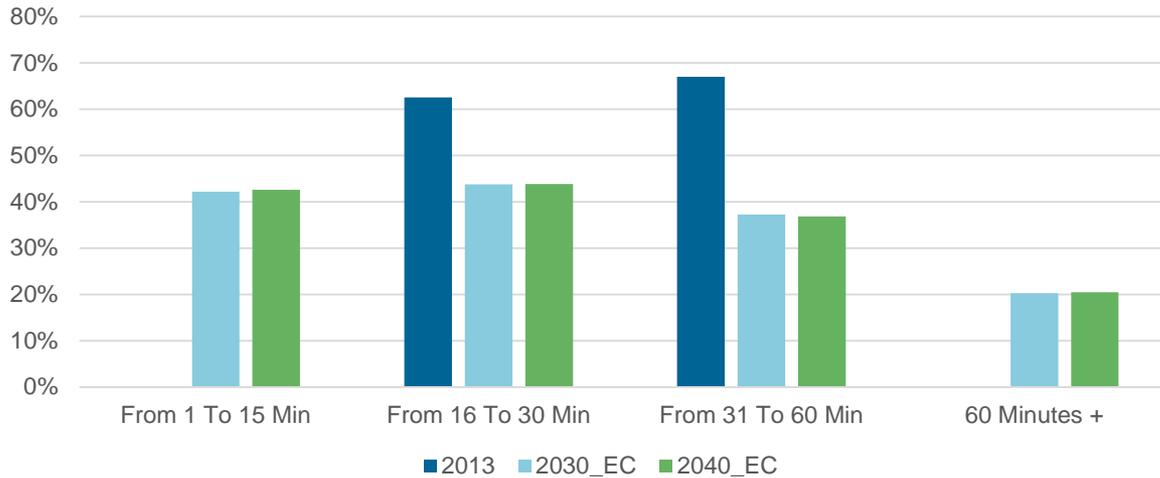


Note: Average time and cost shown for trips with at least one end in AMATS region.

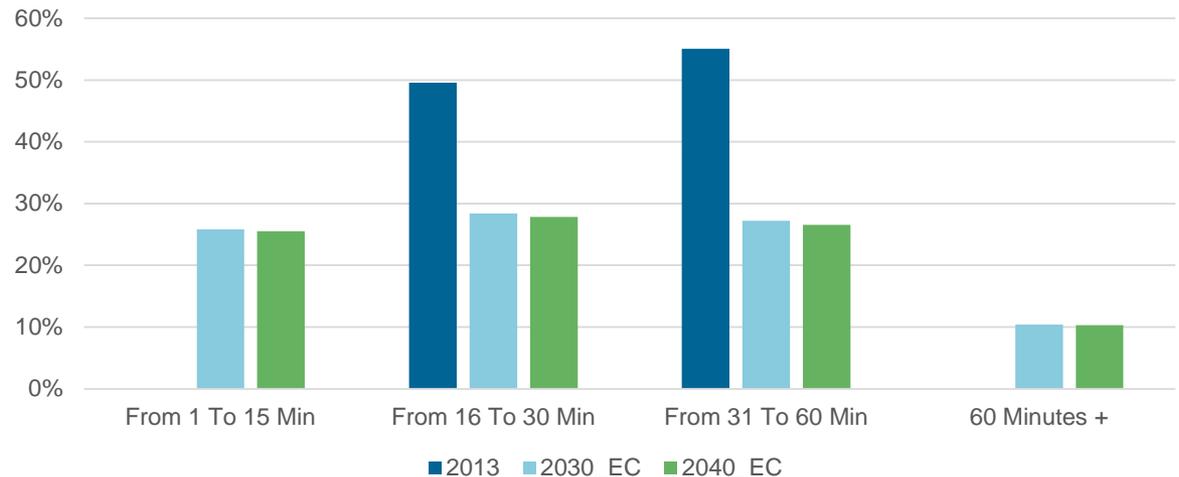


Transit Accessibility

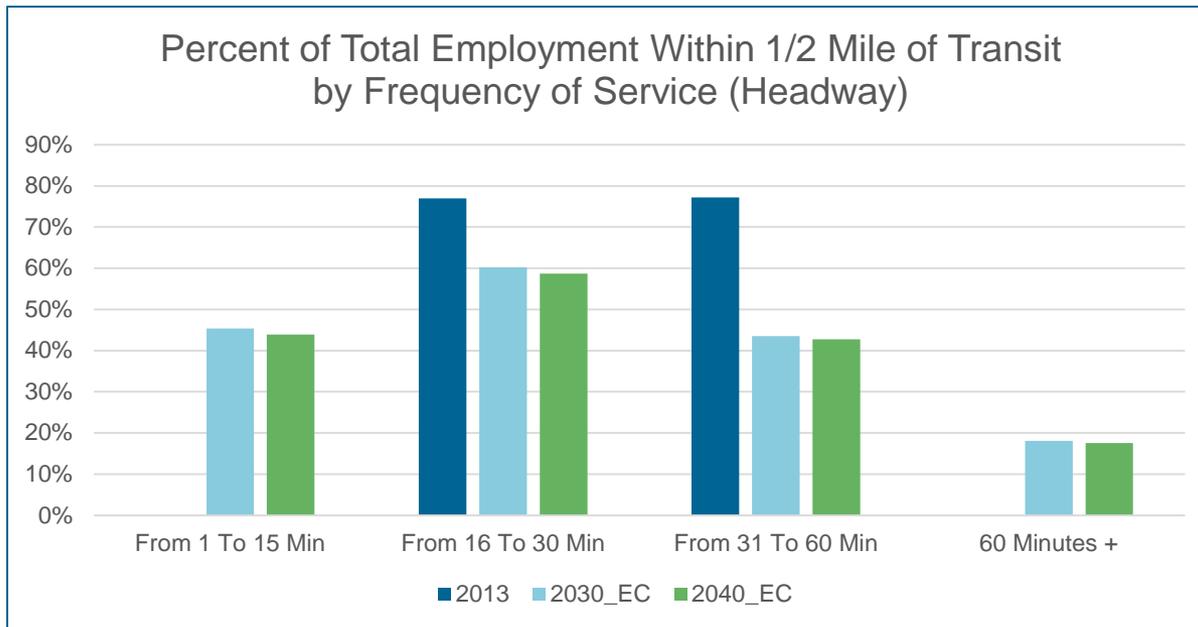
Percent of Low-Income Households Within 1/2 Mile of Transit by Frequency of Service (Headway)



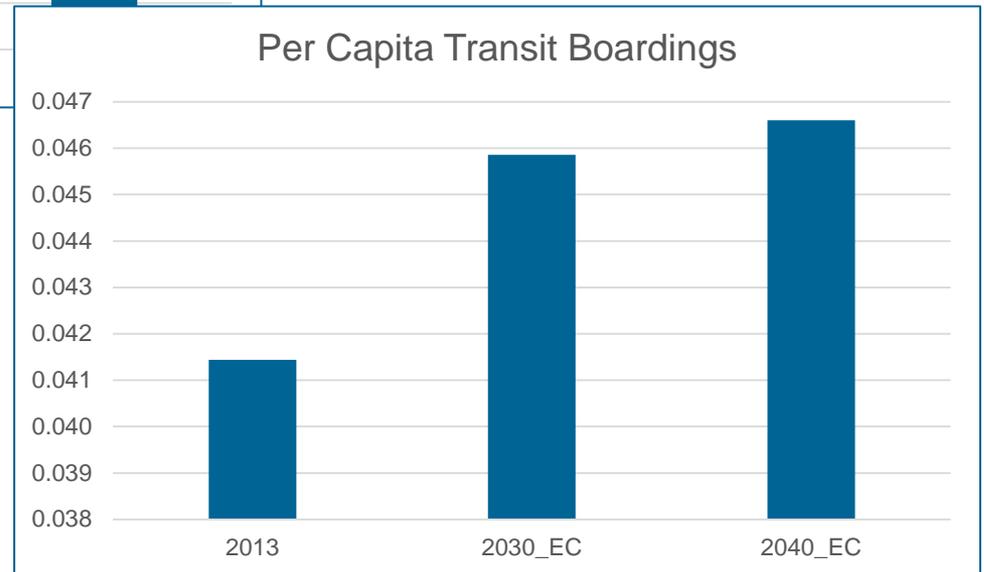
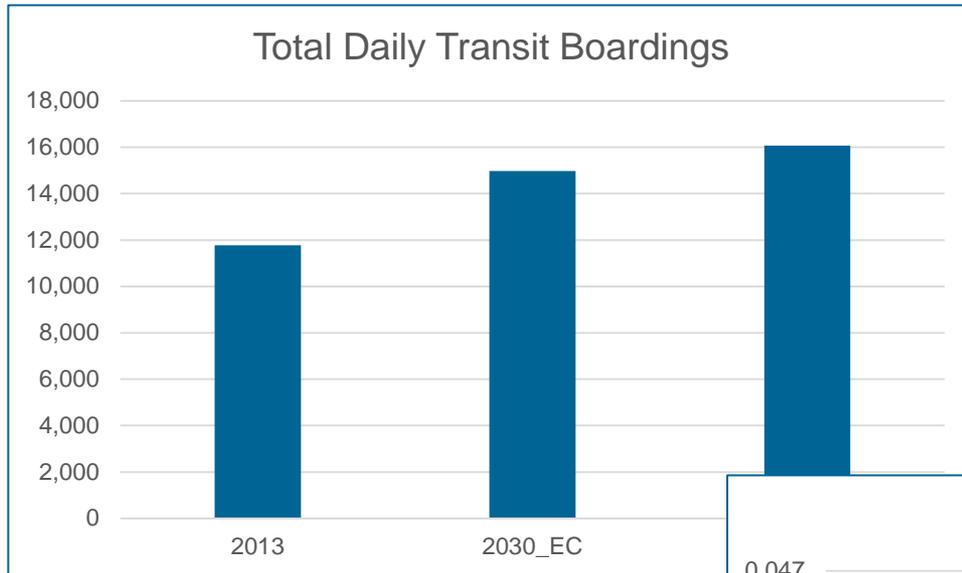
Percent of Total Households Within 1/2 Mile of Transit by Frequency of Service (Headway)



Transit Accessibility

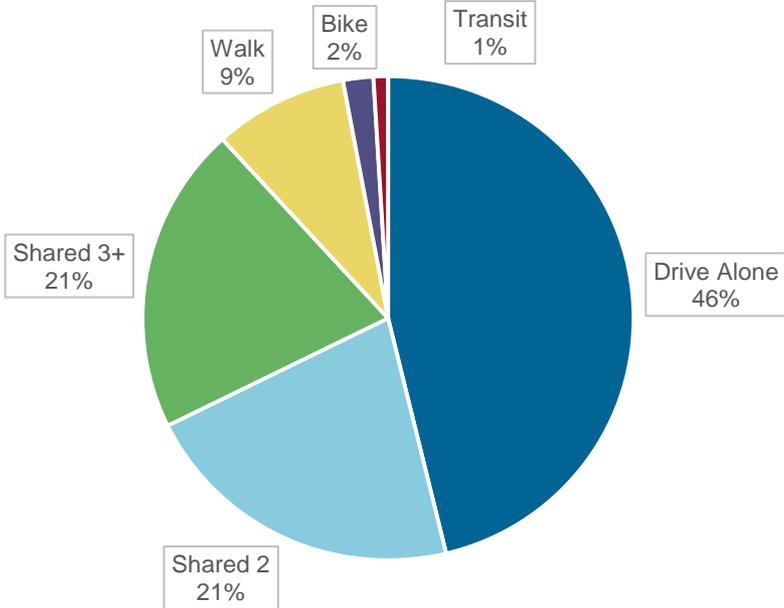


Total Daily Transit Boardings

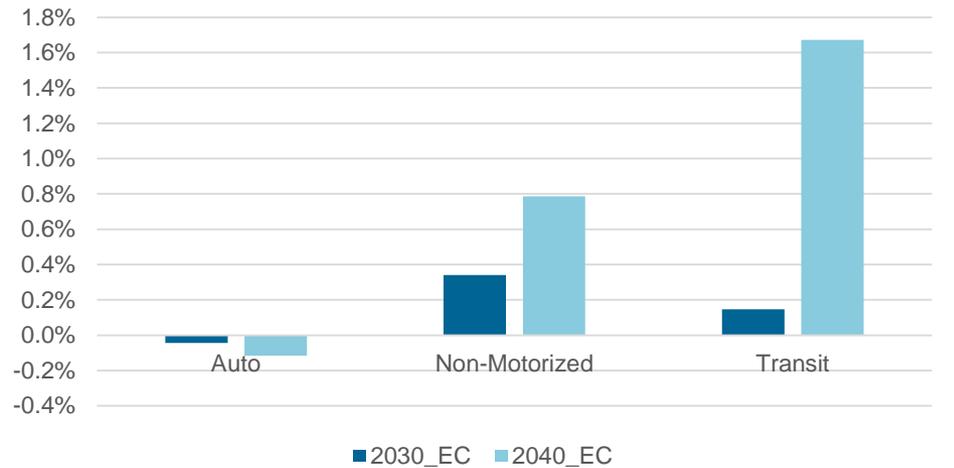


Mode Shares

2013 Mode Share



Percent Change In Mode Share From 2013





System Deficiency Summary

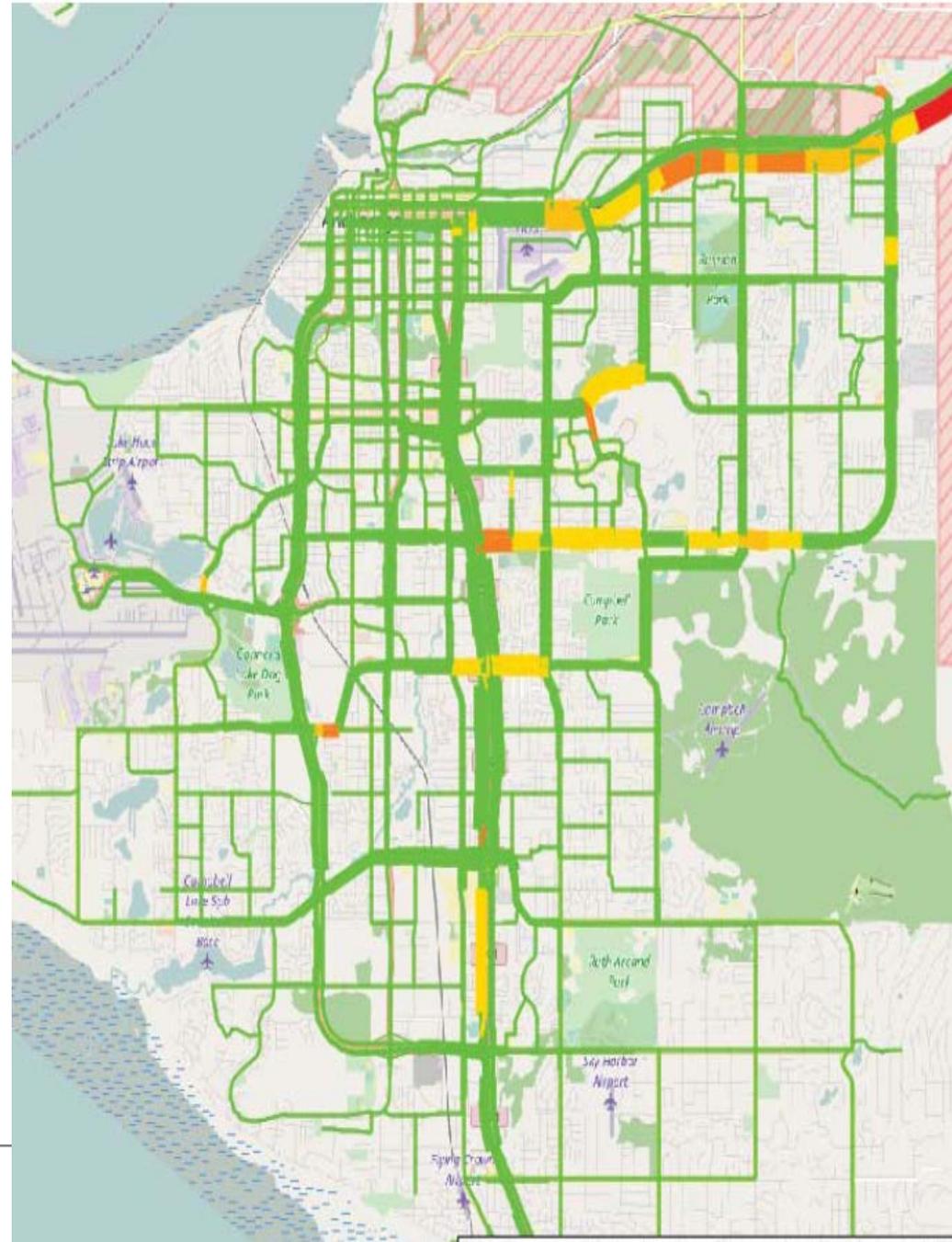
Overview

- Roadway
- Pedestrian
- Bicycle
- Transit
- Freight
- Safety

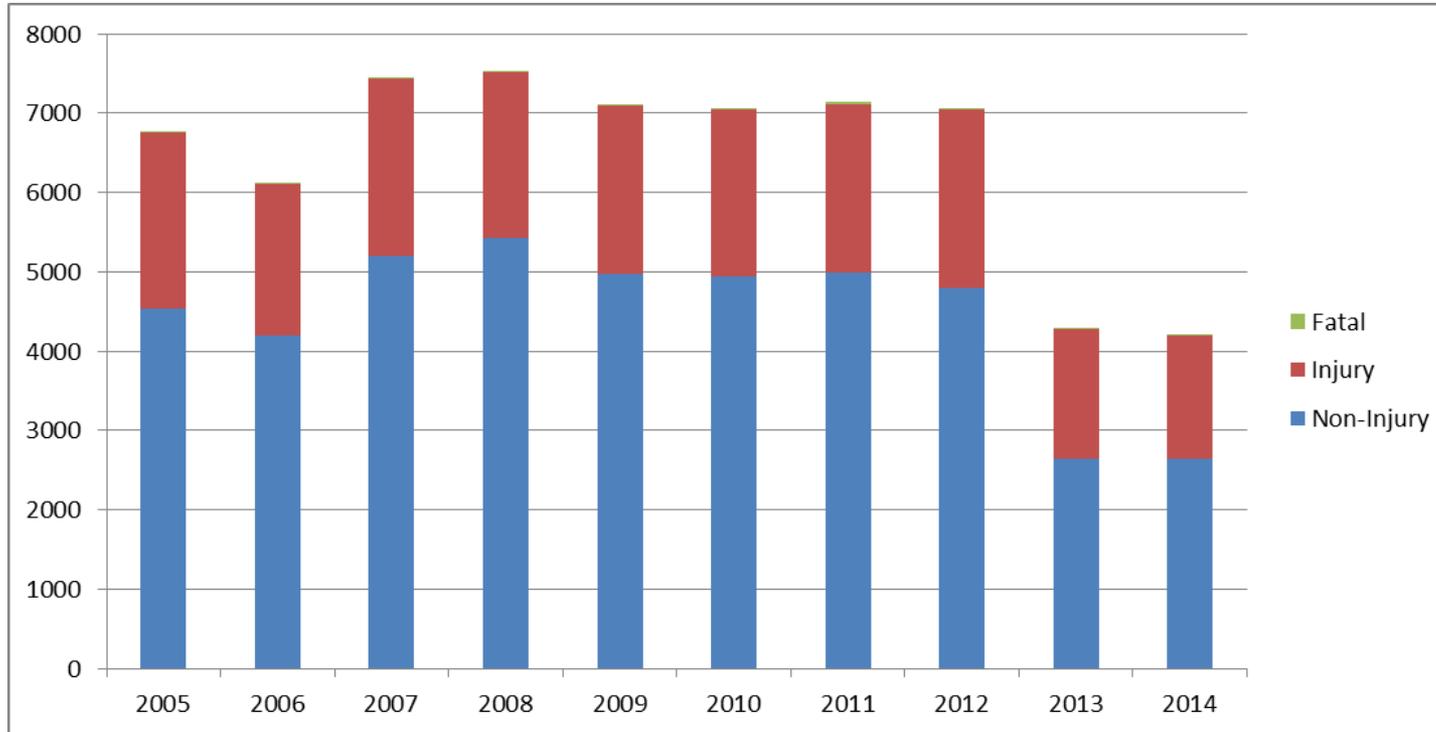


Roadway

- Congested roadways in 2040 include:
 - Glenn Highway
 - Tudor (New Seward Highway to Campbell Airstrip Road)
 - Dowling Road (Old Seward Highway to Lake Otis)
 - Dowling Road (68th to Minnesota)
 - Northern Lights – Bragaw to UAA
 - UAA Drive – Northern Lights to Alumni
 - Southbound New Seward Highway (Dimond and O'Malley)



Safety - Collisions



Source: MOA 2014 Annual Traffic Report



Pedestrian

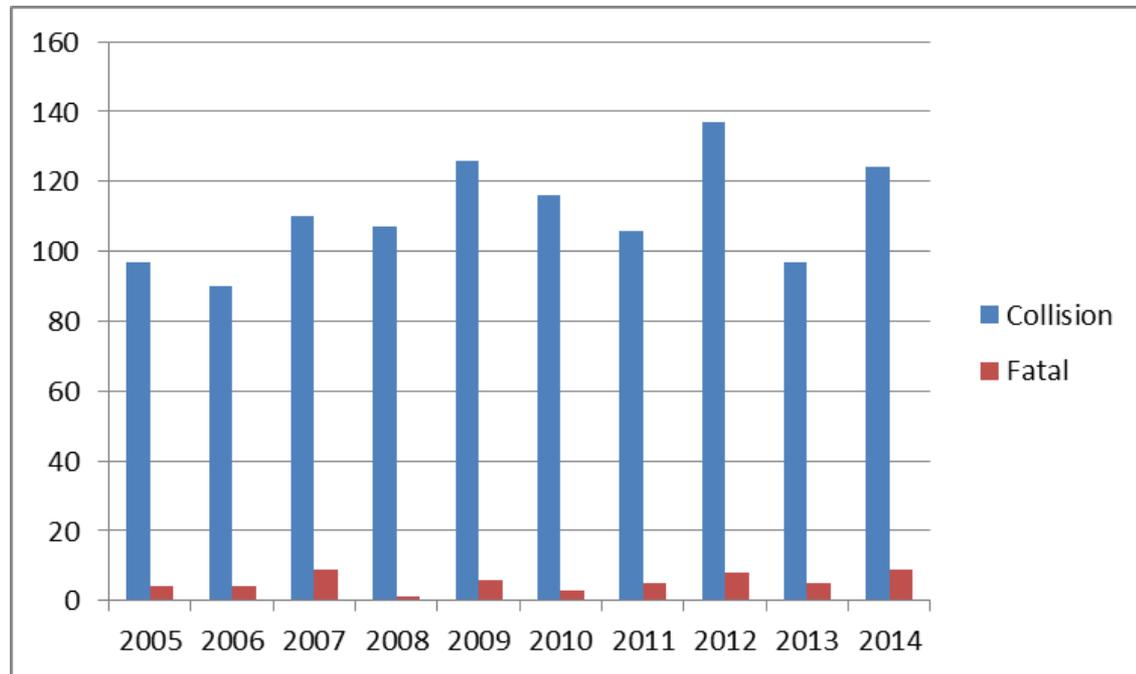
- Incomplete pedestrian system
- Do not meet ADA requirements
- Facilities are too narrow/used for other purposes (i.e utility poles, mailboxes, etc.)
- Facilities are used for snow storage
- Lack of winter maintenance
- Parked vehicles encroach rolled curbs and block sidewalks
- Safety
- Development pattern does not support walking

For additional information, see the MOA Pedestrian Plan.



Safety – Vehicle-Pedestrian Collisions

- Areas of concern:
 - New Seward Highway /Northern Lights and Benson
 - Ingra/Gambell between 9th and 15th
 - A Street between 3rd and 7th
 - Boniface/DeBarr
 - Bean’s Café area
 - Mountain View area?



Source: MOA 2014 Annual Traffic Report



Bicycle

- Use of separated pathways
- Facilities used for snow storage
- Safety
- Gaps in network
- Does not meet existing standards/good practice for bicycle use
- Lack of proper signage
- Insufficient maintenance

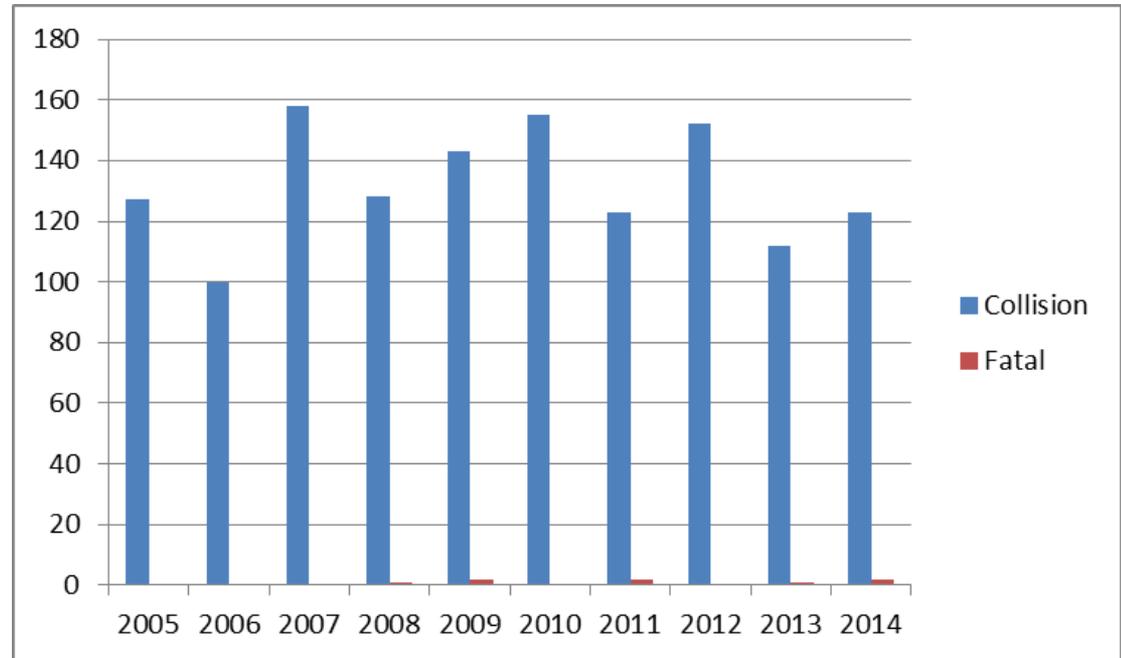
For additional information, see the MOA Bicycle Plan.



Safety – Vehicle/Bicycle Collisions

Areas of concern:

- New Seward Highway/Northern Lights and Benson
- Tudor/C Street
- Lake Otis/36th Ave
- Boniface/Northern Lights



Source: MOA 2014 Annual Traffic Report



Transit

- Ridership versus coverage
- Low frequency of service
- Span of service
- Development not conducive to transit service
- Circuitous routes
- Radial system
- Duplication of service
- Disconnected streets
- Intersections that don't support frequent transfers/unwelcome pedestrian environment
- Sidewalk maintenance

For additional information, see the Anchorage Talks Transit Final Report



Freight

- Roadway/intersection geometry issues
- Aging Port of Anchorage
- Truck/Rail conflicts (including blocked crossings) and at-grade crossings
- Need improved connections
- Dispersed freight generating land uses/land use compatibility
- Lack of redundancy

For additional information, see the draft AMATS Freight Mobility Study





Discussion and Q & A



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